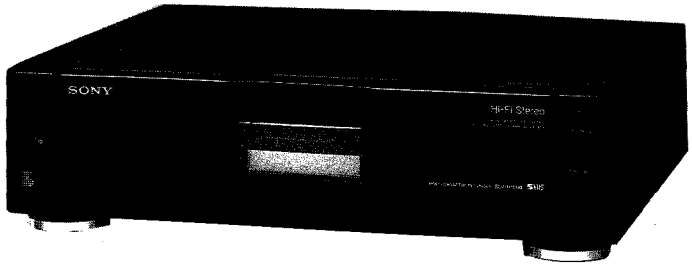
SLV-R1000
RMT-V129A

SERVICE MANUAL

US Model
Canadian Model



- Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENT MANUAL II (9-972-816-11) for MECHANICAL ADJUSTMENTS.

S VHS Hi-Fi

SPECIFICATIONS

System

Format	VHS NTSC standard
Video Recording System	Rotary two-head helical scanning FM system.
Video Head	Four heads
Video signal	NTSC color, EIA standards
Tape Speed	SP: 33.35 mm/s (1 3/8 inches/s) EP: 11.11 mm/s (7/16 inches/s) LP: 16.67 mm/s (11/16 inches/s) Playback only
Maximum recording/ playback time	9 hrs in EP mode (with T-180 tape)
Fast-forward and rewind time	Approx. 4 min 30 s (with T-120 tape)
High-speed rewind time	Approx. 3 min (with T-120 tape)

Tuner Section

Channel Coverage	VHF channels 2 to 13 UHF channels 14 to 69 CATV channels A-8 to A-1, A to W, W+1 to W+84
Antenna	75-ohm antenna terminal for VHF/UHF

Inputs and Outputs

LINE IN 1, 2 and 3	S VIDEO IN (4-pin mini DIN) (1 each) Y: 1 Vp-p 75 ohms (unbalanced), sync. negative C: 0.286 Vp-p (color burst) 75 ohms (unbalanced) VIDEO IN (phono jack) (1 each) Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative AUDIO IN (phono jack) (2 each) Input level: −7.5 dBs (0 dBs = 0.775 Vrms) Input impedance: more than 47 kilohms
LINE OUT 1 and 2	S VIDEO OUT (4-pin mini DIN) (1 each) Y: 1 Vp-p 75 ohms (unbalanced), sync. negative C: 0.286 Vp-p (color burst) 75 ohms (unbalanced) VIDEO OUT (phono jack) (1 each) Output signal: 1 Vp-p, 75 ohms, unbalanced, sync negative AUDIO OUT (phono jack) (2 each) Standard output: −7.5 dBs at load impedance 47 kilohms Output impedance: less than 10 kilohms
CONTROL S IN	Minijack (1)

– continued on next page –

MICROFILM

VIDEO CASSETTE RECODER

SONY®

Timer Section

Clock	Quartz locked
Time Indication	12-hour cycle
Timer Setting	Only for recording 8 programs in one month at max.
Power back-up	Built-in self-charging capacitor Back-up duration: Up to three hours at one time

General

Power requirements	120 V AC, 60 Hz
Power consumption	30 W (max.) 11 W (in standby condition)
Operating temperature	5°C to 40°C (41°F to 104°F)
Storage temperature	−20°C to 60°C (−4°F to 140°F)
Dimensions	430 × 117 × 379 mm (w/h/d) (17 × 4 5/8 × 15 inches)
Weight	7 kg (15 lb 7 oz)

Wireless Commander RMT-V129A

Remote control system	Infrared control
Power requirements	3 V DC, 2 size AA batteries (IEC designation R6)

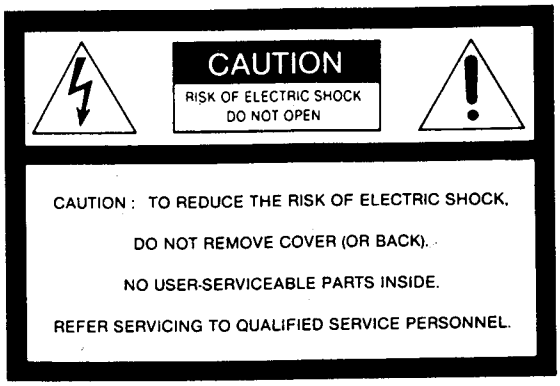
Accessories Supplied

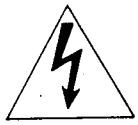
Wireless Commander RMT-V129A ..... (1)
Size AA (R6) batteries ..... (2)
75-ohm coaxial cable with F-type connectors ..... (1)
External antenna connector ..... (1)
AC power cord ..... (1)
Audio/video connecting cable (3 phono to 3 phono) ..... (1)
S VIDEO connecting cable ..... (1)
Cable Mouse (Cable Box Controller) ..... (1)

Design and specifications are subject to change without notice.

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION : TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the coustomer.
6. Check the B + voltage to see it is at the values specified.
7. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

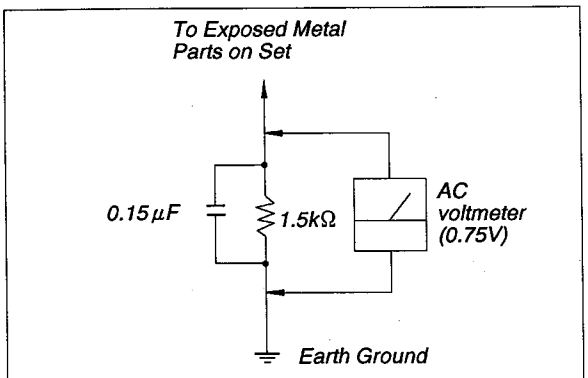


Fig. A. Using an AC voltmeter to check AC leakage.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturer's instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75V, so analog meters must have an accurate lowvoltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

SAFETY - RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÉCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÉCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

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SERVICE NOTE

1. RETURNING PINCH ROLLER, GUIDE ROLLER AND ELEVATOR CAM TO STOP CONDITION

1) Remove the bottom plate.
2) Remove the AV-23, ST-49 Board.
3) Turn the worm gear Ⓐ of the cam motor, located at lower of the MD, to the arrow direction Ⓑ by finger.

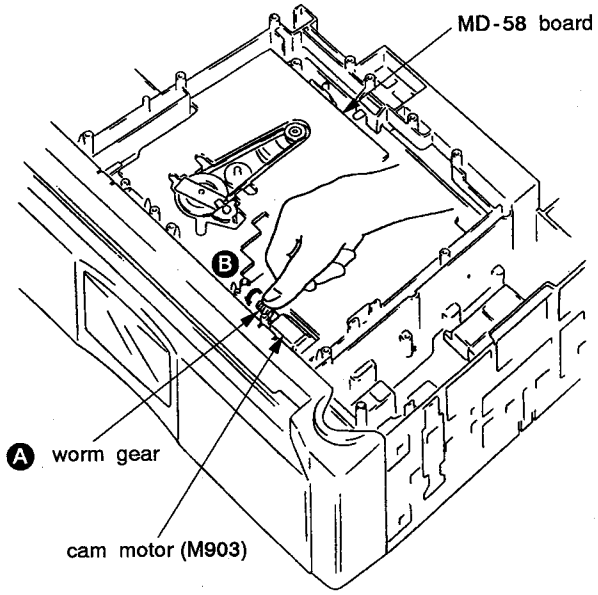


Fig. 1.

2. WINDING TAPE TO CASSETTE HALF

Turn the flywheel Ⓐ of the capstan motor to the arrow direction Ⓑ by finger, then the cassette tape will be wound to the cassette half.

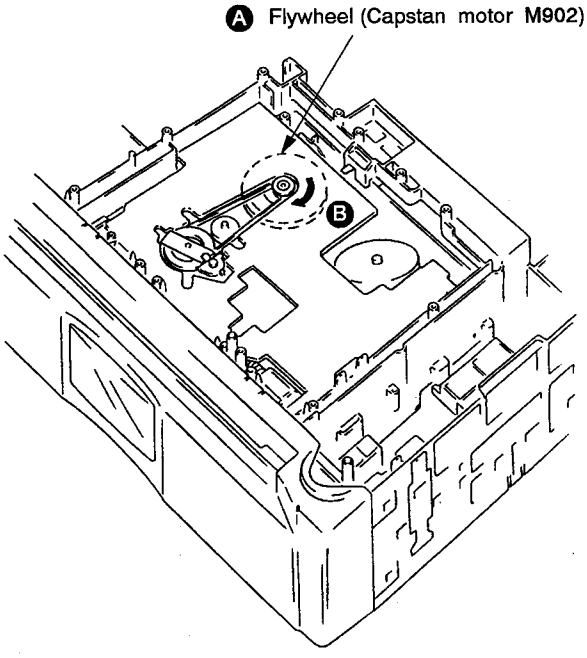


Fig. 2.

3. TAKING OUT CASSETTE WHEN UNIT IS DEFECTIVE WITH CASSETTE IN

1) Remove the upper case.
2) Turn the worm gear Ⓐ of the loading motor to the arrow direction Ⓑ by finger.

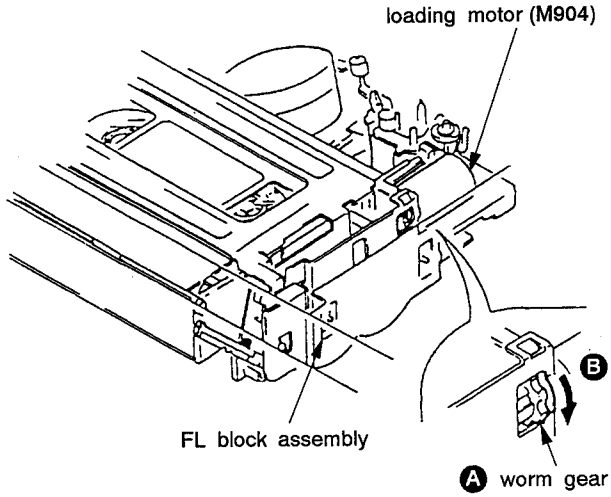


Fig. 3.

Note: When performing 1. to 3., be careful not to clog and damage the cassette tape.

4. UPPER DRUM REPLACEMENT

4-1. Removal of Upper Drum

1) Remove the screw ❶ (BVTP 3×12). (See Fig. 4.)
2) Remove the screw ❷ (P 3×6) and take out the shaft ground assembly ❸. (See Fig. 4.)
3) Completely remove the rotary upper drum board and desolder the soldering indicated by the arrows. (16 points).
4) Remove two screws ❹ (PSW 3×8) and take out the rotary upper drum assembly in the arrow direction Ⓐ. (See Fig. 5.)
   If it is difficult, remove by shaking the rotary upper drum gradually.
   Note: If the drum can not be removed, check whether the solders have been removed or not again.

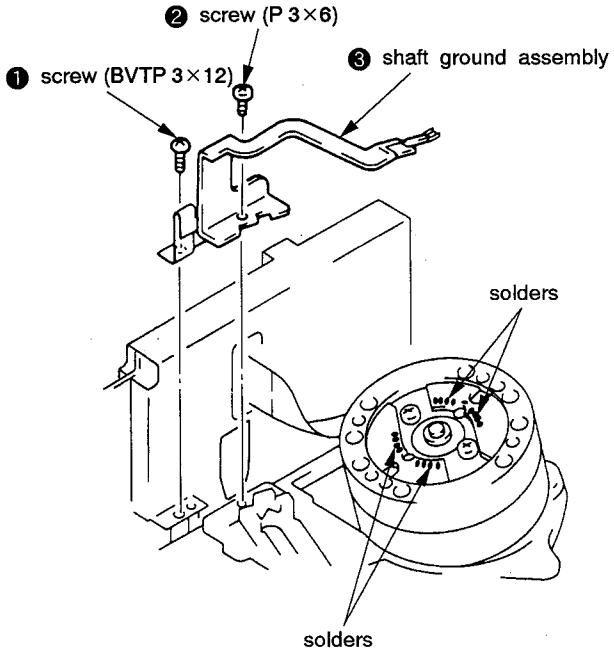


Fig. 4.

4-2. Mounting Upper Drum

1) When inserting the rotary upper drum assembly into the lower drum, be careful not to blur the contacting surface with fingerprint or the like.
2) Mount the rotary upper drum assembly by aligning red head side with marked S1 of rotary transformer board (lower drum) so that the screw holes of both upper and lower drums match.
   (See Fig. 5.)
3) If it is difficult, mount the upper drum by shaking it gradually.
   Note: Be careful not to damage the head. Make sure that the upper drum is tightly inserted.
4) Tighten two screws ❹ (PSW 3×8). (See Fig. 5.)
   Note: Temporary tighten two screws. After making sure that upper drum is tightly inserted, tighten the screws.
5) Solder 16 points on the board of the rotary upper drum assembly.
6) Fix the shaft ground assembly ❸ using the screw ❷ (P 3×6) so that the protrusion of the shaft ground assembly end contacts the center of the drum shaft.
   Note: When attaching the shaft ground assembly ❸, be careful not to apply force to the spring section of it.
7) Tighten a screw ❶ (BVTP 3×12). (See Fig. 4.)

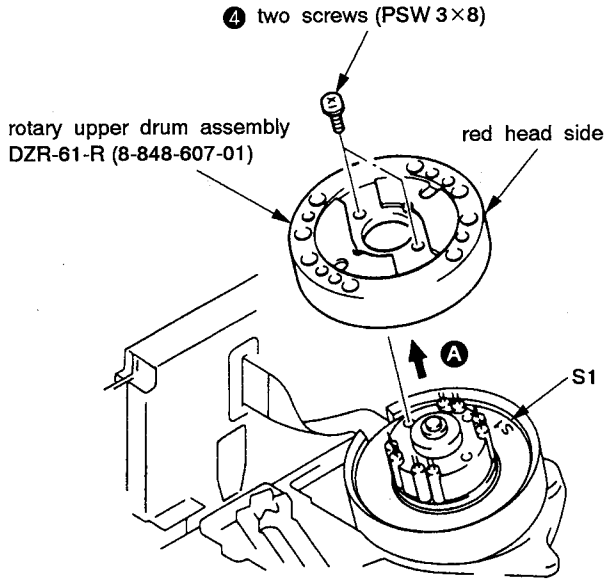


Fig. 5.

Precautions

Safety

- Operate the unit only on 120 V AC, 60 Hz.
- If anything falls into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- One blade of the plug is wider than the other for the purpose of safety and will fit into the power outlet only one way. If you are unable to insert the plug fully into the outlet, contact your dealer.
- Unplug the unit from the wall outlet if you do not intend to use it for an extended period of time. To disconnect the cord, pull it out by the plug, never by the cord.

Installation

- Allow adequate air circulation to prevent internal heat build-up.
- Do not place the unit on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the ventilation slots.
- Do not install the unit near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- Do not install the unit in an inclined position. It is designed to be operated in a horizontal position only.
- Keep the unit and cassettes away from equipment with strong magnets, such as microwave ovens or large loudspeakers.
- Do not place heavy objects on the unit.

Operation

- When the unit is not in use, turn the power off to conserve energy and to extend its life.
- Remove and store video cassettes after recording or playback.

Cleaning

- Clean the cabinet, panel and controls with a dry, soft cloth, or a soft cloth slightly moistened with a mild detergent solution.
- Do not use any type of solvent, such as alcohol or benzine.

About the S-VHS System

The S-VHS system provides sharp, finely detailed pictures* through the S-VHS video signal recording/playback circuit and high quality S-VHS tape.
* Approximately 400 TV lines of horizontal resolution

This VCR can record and play back high quality pictures when you use tapes bearing the S-VHS mark. The unit also can record and play back tapes bearing the VHS mark.

On the recording/playback format and the types of video cassettes to be used
Before you begin, check to see which recording/playback format (S-VHS or VHS) you will use, referring to the following table.

	Tape used	Recording/playback format
During recording	S-VHS tape	Setting of S-VHS switch ➡ "ON" → S-VHS "OFF" → VHS
	VHS tape	VHS format regardless of the S-VHS switch setting
During playback	Tape recorded in S-VHS format	Playing back on an S-VHS VCR ➡ **Automatically selected** A tape recorded in the S-VHS format will be played back in the S-VHS format. The tape recorded in the VHS format will be played back in the VHS format. Playing back on a VHS VCR ➡ **A tape recorded in the S-VHS format cannot be played back.** A tape recorded in the VHS format will be played back in the VHS format.
	Tape recorded in VHS format	VHS format

About Recording and Playback with this VCR

On recording and playback format
- This VCR bears the S-VHS mark.
- If you record TV programs with this VCR, the recorded pictures will be played back giving the horizontal resolution level of the TV.

On the cassettes used
- Use video cassettes bearing the S-VHS mark or the VHS mark.
- Video cassettes recorded in the VHS format can be played back on this VCR.
- Video cassettes recorded in the S-VHS format using this VCR cannot be played back on a VCR with the VHS mark only.
- Some video sources used in other countries cannot be played back on this VCR due to the differences in color systems.

Introduction

Using This Manual

This manual is divided into five chapters.
The chapters and their contents are as follows:

Preliminaries **(page 2)**
Preparation **(page 6)**
Basic Operations **(page 29)**
Advanced Operations **(page 48)**
Additional Information **(page 62)**

If you are using your VCR for the first time, start from the section **"Hookups and Getting Started"** (page 6). This section explains how to hookup, set up, and operate your VCR so that you can start enjoying it right away.

For information about the VCR's basic operations, such as Playback (page 29), Recording TV Programs (page 34), or Timer Recording (page 37), see **Basic Operations**.

If you are already familiar with the basic operations, see **Advanced Operations**.

If you have any problems in operating the VCR, refer to **Troubleshooting**. If your VCR is in need of repair, contact your nearest Sony Service Center facility.

Conventions of this manual

This manual explains operations using the VCR Remote Commander. However, the buttons on the VCR with the same name or mark as those on the Remote Commander function exactly the same as those of the Remote Commander.

When you are reading through the manual, remember:
- Buttons and switches are shown in uppercase letters. Example: Press ▶ PLAY.
- Numbers in the illustrations correspond to numbers in the text.
- → indicates signal flow.
- Notes and cautions are enclosed in boxes.
- On-screen displays for the USA model are used to explain operations requiring on-screen menus.

Unpacking

Check that you have received the following accessories:
- Remote Commander RMT-V129A
- Size AA (R6) batteries (2)
- External antenna connector (1)
- 75-ohm coaxial cable with F-type connectors (1)
- AC power cord (1)
- Audio/video connecting cable (3 phono to 3 phono) (1)
- S VIDEO connecting cable (1)
- Cable Mouse (Cable Box Controller) (1)

Overview

High-quality picture

The S-VHS system gives you 400 lines of horizontal resolution, enabling you to obtain a high quality picture.

Features

- **VCR Plus+ system**
  Allows you to quickly and easily preset up to eight TV programs.
- **Cable box control**
  Allows your VCR to control channel selection on most cable boxes.
- **APC (Adaptive Picture Control) function**
  Automatically optimizes recording and playback performance by adjusting the video circuitry for each tape that you use.
- **Auto tracking function**
  Automatically adjusts the tracking condition for optimum picture quality.
- **Timer recordings of eight programs in a month**
  Recording of up to eight TV programs can be preset up to one month in advance.
- **DUAL MODE SHUTTLE ring**
  Allows quick access to a desired scene and playback at various speeds in forward and reverse directions.
- **Index function**
  The beginning of a desired scene can be located easily with the index search function.
- **Multi-brand TV control Remote Commander**
  The Remote Commander can control Sony and other manufacturer's TV sets.
- **Auto head cleaner**
  Cleans the video heads each time a cassette is inserted or ejected.

Editing

- **Flying erase head**
  Allows clean, concise editing with less noise.
- **Input connectors on the front panel**
  Allows easy connection to a camcorder.
- **Insert editing**
  Allows easy superimposition of pictures and/or sound onto a prerecorded cassette.
- **CONTROL L jack**
  Control L connection lets you easily perform tape editing.
- **CONTROL S INPUT jack**
  Allows remote control of this VCR by other Sony video equipment with a CONTROL S OUTPUT jack.

On-screen display

- **DISPLAY**
  Tape counter, cassette speed, operation mode, and remaining cassette length can be displayed on the TV screen.
- **TIMER SET/CHECK display**
  Timer recording settings can be set and checked by referring to the TV screen.
- **ON SCREEN HELP message**
  The VCR gives a message on screen with a beep tone to warn that you have attempted an incorrect operation.

VCR Plus+ and PlusCodé are trade marks of Gemstar Development Corp.
VCR Plus+ system is manufactured under license from Gemstar Development Corporation.

This section is extracted from instruction manual.

Hookups and Getting Started

Before you can use your VCR for the first time, you need to connect it to your TV and set it up to receive programs for viewing and recording. This section explains how to hook up, set up, and operate your VCR so that you can start enjoying it right away. There are, however, many types of TVs available and many different ways in which your TV can be hooked up. As a result, this manual describes several ways your VCR can be connected.

To hook up your VCR so that it works best for you, first scan through the table below. Then use the accompanying diagrams and procedures on the following pages to complete your VCR's connections.

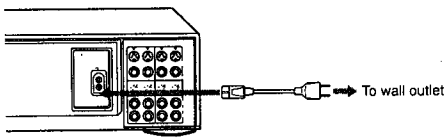
If you ...	Use	Refer to
Have Audio/Video Inputs on your TV.	Hookup 1 first, then proceed.	Page 7
Have a cable box.	Hookup 2. TV signal → Cable Box → VCR	Page 8
Have cable, but don't have a cable box.	Hookup 3. TV signal → VCR	Page 10
Have a cable box that cannot be controlled by the VCR's cable box control feature.	Hookup 3 or 4, (or contact your cable company. They may be able to supply a compatible cable box.) TV signal → Cable Box → VCR	Pages 10 or 12
Have an antenna, not cable TV.	Hookup 5. TV signal → VCR	Page 14

After you've completed the connections, follow the instructions for setup, including VCR Plus+ setup. (During setup, if you need more details of the procedures described, page numbers are provided where you can find complete, step-by-step instructions.)

After you've completed the setup, you're ready to use your VCR. Follow the instructions provided in "To Watch the TV," "To Watch the VCR," and "To Record A Program" for your specific hookup.

(Again, if you need step-by-step instructions, page numbers are provided where you can find this information.)

Before making the connections, check the following points:
- Turn off the power to the VCR and TV.
- Do not connect the AC power cord until all of the connections are completed.



- Make connections firmly. Loose connections may cause picture distortion.
- If your TV doesn't match any of the examples provided, consult your nearest Sony dealer or qualified technician.

Caution
Connections between the VCR VHF/UHF OUT connector and the antenna terminals of a TV receiver should be made only as shown in the instructions. Failure to do so may result in operation that violates the regulations of the Federal Communications Commission regarding the use and operation of RF devices. Never connect the output of the recorder to an antenna or make simultaneous (parallel) antenna and recorder connections at the antenna terminals of your receiver.

Hookup 1

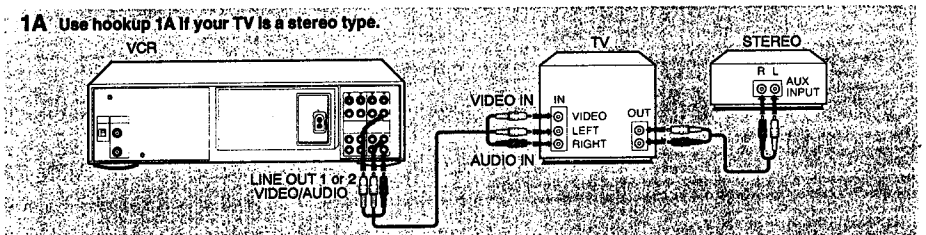
Audio/Video (A/V) Hookup

If your TV has audio/video (A/V) input jacks, you will get a better picture and sound if you hook up your VCR using these connections. In addition, for a true "home theater" experience, you should connect the audio outputs of your VCR or TV to your stereo system.

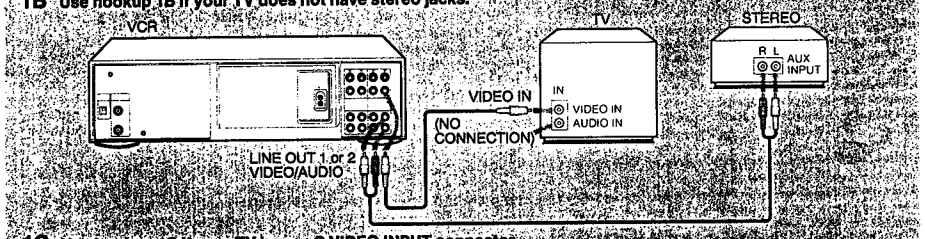
If your TV doesn't have A/V inputs, see the following pages for antenna or cable hookup.

If you intend to use the VCR for playback only, you're finished after you've made these connections. If you want to record off-air or off your cable TV system, please do the A/V hookup on this page first, then proceed to the following pages for antenna or cable hookup.

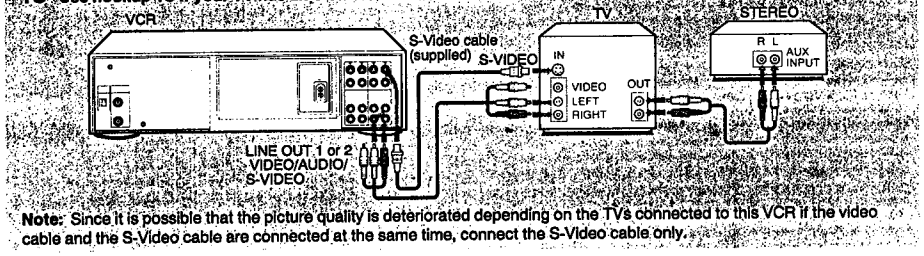
1A Use hookup 1A if your TV is a stereo type.



1B Use hookup 1B if your TV does not have stereo jacks.



1C Use hookup 1C if your TV has an S VIDEO INPUT connector.

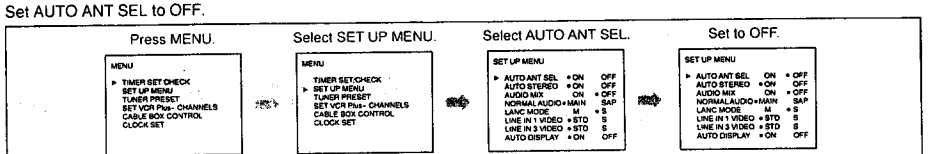


Note: Since it is possible that the picture quality is deteriorated depending on the TVs connected to this VCR if the video cable and the S-Video cable are connected at the same time, connect the S-Video cable only.

After you've hooked up your TV using the A/V connections, use the following procedure to set up and use the VCR with your TV.

A/V Setup & Operation

Set AUTO ANT SEL to OFF.



Details are on page 27.

Hookup 2 – Using VCR Cable Box Control

Cable Hookup

Recommended Use:
This hookup is recommended for most cable systems. It allows the VCR's cable box control feature to control the channel on the cable box, simplifying the recording process. You should use this hookup if you have a cable box, especially if your cable company "scrambles" all or most channels.

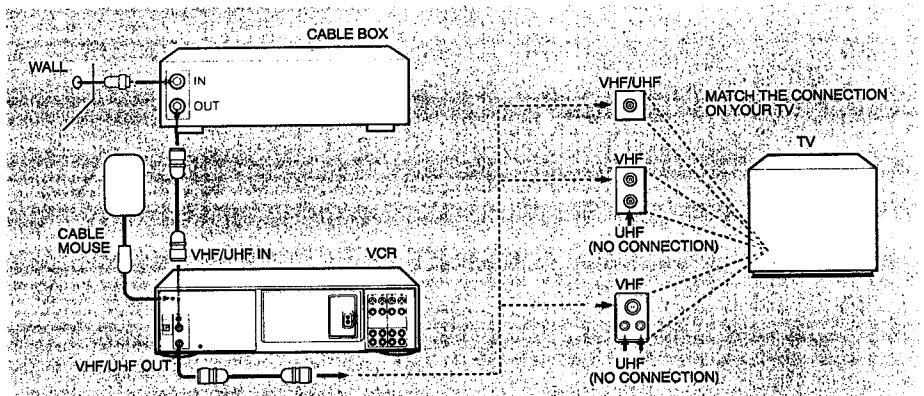
A list of compatible cable boxes is on page 26. If, after checking your setup, you are sure that the VCR will not control your cable box, contact your cable company. They may be able to supply a compatible cable box.

If your cable company cannot supply a compatible cable box, and your cable system only "scrambles" a few channels, you must use Hookup 4.

Background

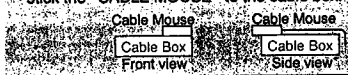
This VCR can record most unscrambled cable channels. Some cable systems "scramble" specific channels, usually premium or pay-per-view channels. In order to record these "scrambled" channels you should use this hookup.

This hookup simplifies recording channels from the cable box, by using the VCR's cable box control feature to change channels on the cable box. The cable box control feature allows the VCR to change channels on most cable boxes that are capable of infrared remote control.



Cable Mouse Hookup

Position the "CABLE MOUSE" on the cable box as shown below. Make sure that the front of the "CABLE MOUSE" projects out in front of the cable box. Remove the protective film from the double-side tape to stick the "CABLE MOUSE" to the cable box.



For best results, position the cable box away from the VCR.

What You Can and Can't Do With This Hookup

What You Can Do

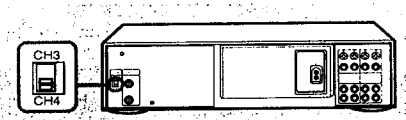
- Record any channel by selecting the channel on the cable box from your VCR.

What You Can't Do

- Record with the cable box turned off.
- Record one channel while watching another channel.

VCR Setup (Simple Cable)

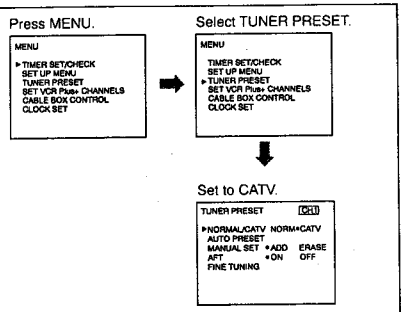
1 Set the RF UNIT on the VCR's rear panel to CH3 or CH4.
If you made A/V connections, skip this step.



Set to whichever channel is not used in your area. If both are used, pick either channel.
Details are on page 62.

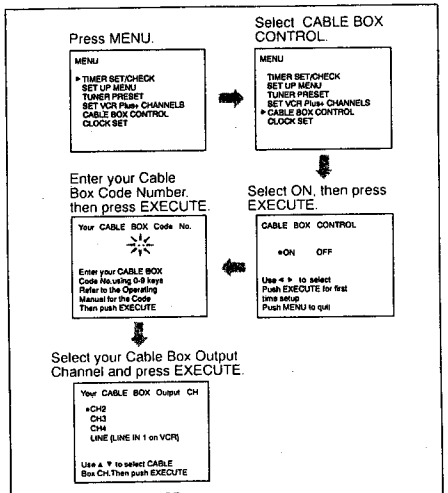
2 Switch on your cable box.

3 Set NORMAL/CATV to CATV.



Details are on pages 21 and 22.

4 Set the CABLE BOX CONTROL to ON.

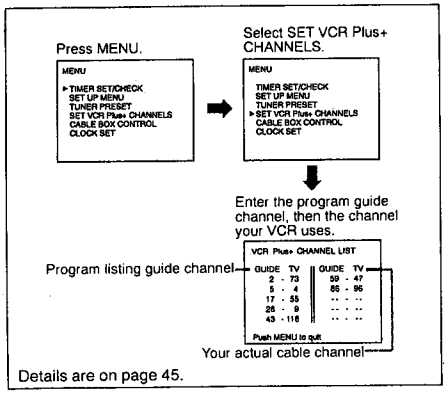

Press MENU.
Select CABLE BOX CONTROL.
Enter your Cable Box Code Number, then press EXECUTE.
Select ON, then press EXECUTE.
Select your Cable Box Output Channel and press EXECUTE.
MENU
TIMER SET/CHECK
SET UP MENU
TUNER PRESET
SET VCR Plus+ CHANNELS
CABLE BOX CONTROL
CLOCK SET
Your CABLE BOX Code No.
Enter your CABLE BOX Code No. using 0-9 keys
Refer to the Operating Manual for the Code
Then push EXECUTE
CABLE BOX CONTROL
•ON OFF
Use ◄ ► to select
Push EXECUTE for first time setup
Push MENU to quit
Your CABLE BOX Output CH
•CH2
CH3
CH4
LINE (LINE IN 1 on VCR)
Use ▲ ▼ to select CABLE Box CH.Then push EXECUTE

Details are on page 25.

VCR Plus+ Channel Setup

1 Find the VCR Plus+ Channel Listing in your program guide. For details, see page 44.

2 If the channels in the program guide are different from the channels that you actually use on your TV, set the channels that are different as follows.



Details are on page 45.

To Watch the TV

1 Turn your VCR off, or press the VCR's TV/VTR button until the VTR indicator in the display window goes off.
2 Switch on your cable box.
3 Tune the TV to the cable box output channel (usually 2, 3, or 4).
4 Select the channel that you want to watch with your cable box.

To Watch the VCR

1 Tune the TV to CH3 or CH4, (or to A/V input if you made A/V connections).
2 Insert a cassette and press ► PLAY.

Details are on page 30.

To Record A Program

1 Switch on the cable box.
2 Press VCR Plus+ on the Remote Commander.
3 Enter the program's PlusCode number.
4 Press ONCE, DAILY, or WEEKLY on the Remote Commander.
5 Insert a blank cassette.
6 Press TIMER REC on the Remote Commander.
7 Leave the cable box on.

Details are on page 46.

Hookup 3 – No Cable Box or Incompatible Cable Box, Few "Scrambled" Channels

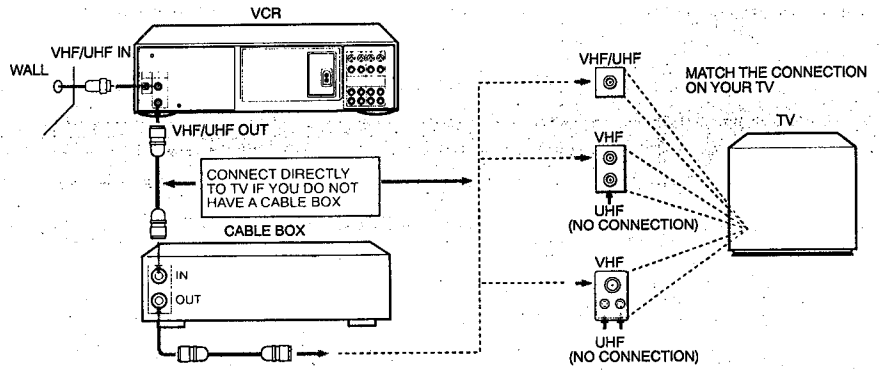
Cable Hookup

Recommended Use:
Use this hookup if you do not have a cable box.

Also use this hookup if your cable company cannot supply a cable box that is compatible with the VCR's cable box control feature, and your cable system "scrambles" only a few channels.

Background

This VCR can record most unscrambled cable channels. Some cable systems "scramble" specific channels, usually premium or pay-per-view channels. You will not be able to record "scrambled" channels with this hookup. In order to record "scrambled" channels you should use Hookup 2. The "cable mouse" is not used in this hookup.



What You Can and Can't Do With This Hookup

What You Can Do

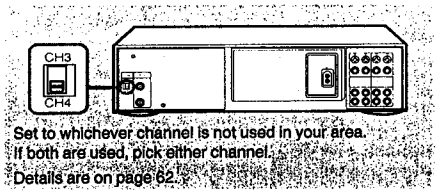
- Record unscrambled channels directly, without using a cable box.

What You Can't Do

- Record scrambled channels that require a cable box.
- Use the VCR's cable box control feature.

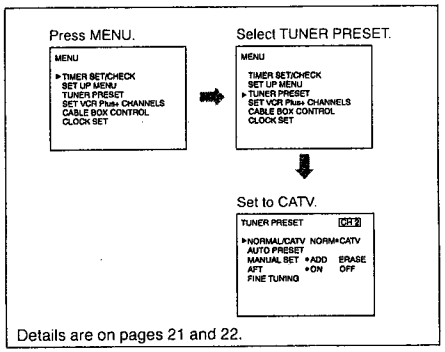
VCR Setup

1 Set the RF UNIT on the VCR's rear panel to CH3 or CH4.
If you made A/V connections, skip this step.

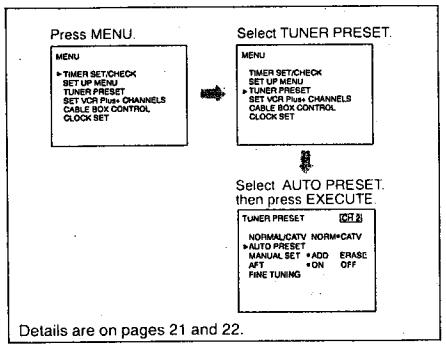


2 Set CABLE BOX CONTROL to OFF (this is the factory setting) using the on-screen MENU.

3 Set NORMAL/CATV to CATV.



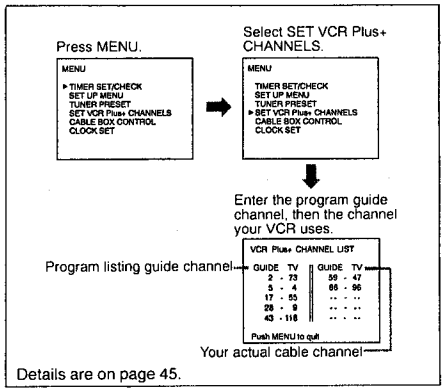
4 Preprogram the channels into the VCR.



VCR Plus+ Channel Setup

1 Find the VCR Plus+ Channel Listing in your program guide. For details, see page 44.

2 If the channels in the program guide are different from the channels that you actually use on your TV, set the channels that are different as follows:


Press MENU.
Select SET VCR Plus+ CHANNELS.
Enter the program guide channel, then the channel your VCR uses.
Program listing guide channel
Your actual cable channel
Details are on page 45.

To Watch the TV

1 Turn your VCR off, or press the VCR's TV/VTR button until the VTR indicator in the display window goes off.

2 Select the channel with your cable box (if you have one), or directly tune with your TV (if you don't).

To Watch the VCR

1a If you didn't use the A/V input:
- Turn ON the cable box.
- Select CH 3 or CH 4 on the **cable box** (whichever you set on the back of the VCR).
- Select the output channel of the cable box (usually 2, 3 or 4) on your TV.

1b If you made the A/V connections on page 7:
Set your TV to the A/V input.

2 Insert a cassette and press ▶ PLAY.

Details are on page 30.

To Record a Program

1 Press VCR Plus+ on the Remote Commander.
2 Enter the program's PlusCode number.
3 Press ONCE, DAILY, or WEEKLY on the Remote Commander.
4 Insert a blank cassette.
5 Press TIMER REC on the Remote Commander.

Details are on page 46.

Hookup 4 – Incompatible Cable Box, Many "Scrambled" Channels

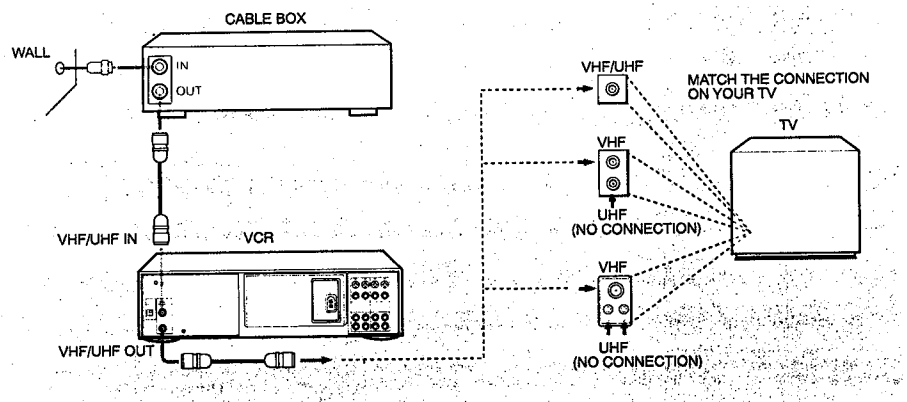
Cable Hookup

Recommended Use:
Use this hookup if your cable company cannot supply a cable box that is compatible with the VCR's cable box control feature, and your cable system "scrambles" all, or most, channels.

Background

This VCR can record most unscrambled cable channels. Some cable systems "scramble" specific channels, usually premium or pay-per-view channels.

If your cable company cannot supply a cable box that is compatible with the VCR's cable box control, and it is necessary to use a cable box because all or most channels are "scrambled", you must use this hookup. It will be necessary to set the cable box channel manually for each recording.
If your cable company cannot supply a compatible cable box, and your cable system only "scrambles" a few channels, use Hookup 3.



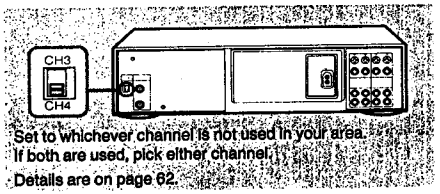
What You Can and Can't Do With This Hookup

What You Can Do
- Record any channels by selecting the channel on the cable box.

What You Can't Do
- Record with the cable box turned off.
- Record by selecting channels directly from the VCR.
- Record one channel while watching another channel.
- Use the VCR's cable box control feature.

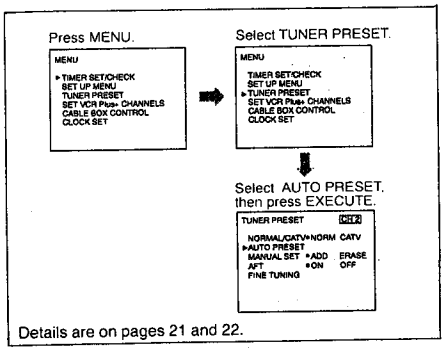
VCR Setup

1 Set the RF UNIT on the VCR's rear panel to CH3 or CH4.
If you made A/V connections, skip this step.



2 Switch on your cable box.

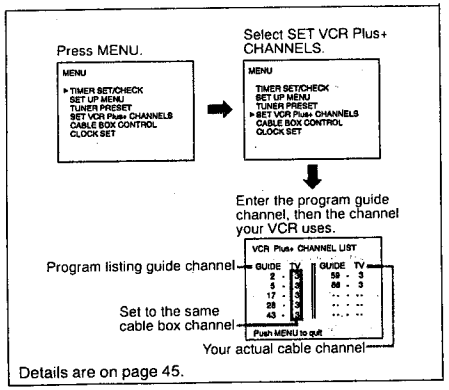
3 Preprogram the channels into the VCR.



VCR Plus+ Channel Setup

1 Find the VCR Plus+ Channel Listing in your program guide. For details, see page 44.

2 For all channels that you want to record, set each channel to the channel that your cable box uses for its output (usually 2, 3, or 4), as follows:


Press MENU.
Select SET VCR Plus+ CHANNELS.
Enter the program guide channel, then the channel your VCR uses.
Program listing guide channel
Set to the same cable box channel
Your actual cable channel
Details are on page 45.

To Watch the TV

1 Turn your VCR off, or press the VCR's TV/VTR button until the VTR indicator in the display window goes off.
2 Switch on your cable box.
3 Tune the TV to the cable box output channel (usually 2, 3, or 4).
4 Select the channel that you want to watch with your cable box.

To Watch the VCR

1 Tune the TV to CH 3 or CH 4 (or to A/V input if you made A/V connections).
2 Insert a cassette and press ▶ PLAY.

Details are on page 30.

To Record a Program

1 Switch on the cable box.
2 Select the channel you wish to record on the cable box.
3 Press VCR Plus + on the Remote Commander.
4 Enter the program's PlusCode number.
5 Press ONCE, DAILY, or WEEKLY on the Remote Commander.
6 Insert a blank cassette.
7 Press TIMER REC on the Remote Commander.
8 Leave the cable box on.

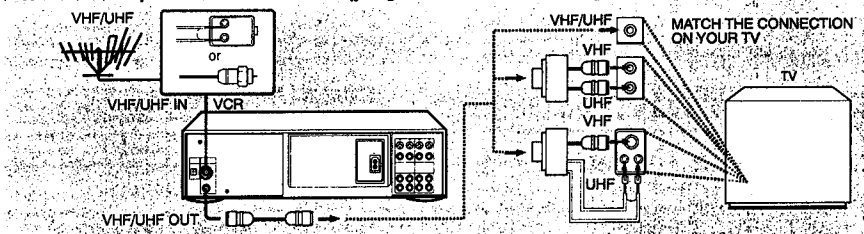
Details are on page 46.

Hookup 5

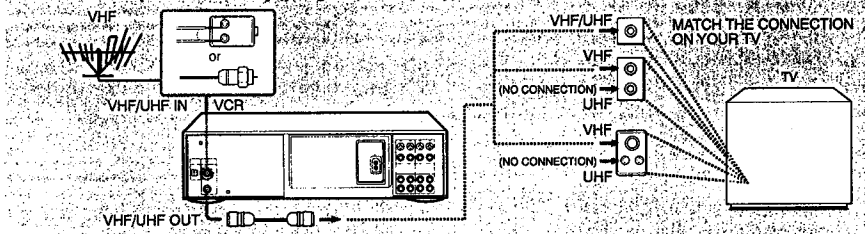
Antenna Hookup

Make the following connections if you're using an antenna (not cable TV).

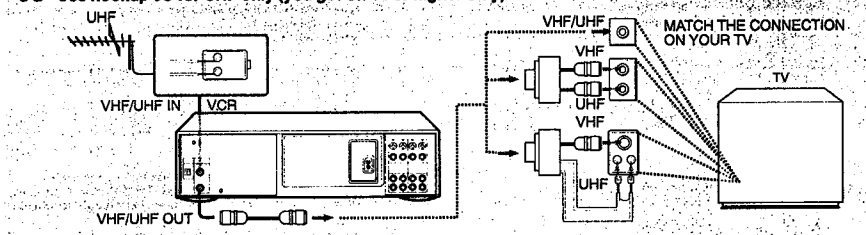
5A Use hookup 5A for VHF/UHF antenna (you get Ch 2-13 and Ch 14 or higher).



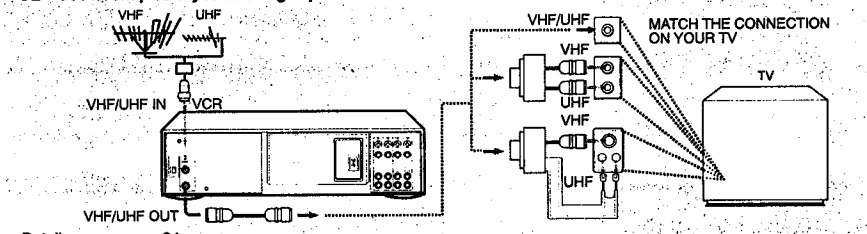
5B Use hookup 5B for VHF only (you get Ch 2 – 13 only).



5C Use hookup 5C for UHF only (you get Ch 14 or higher only).



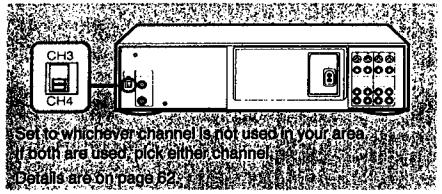
5D Use hookup 5D if you're using separate VHF and UHF antennas.



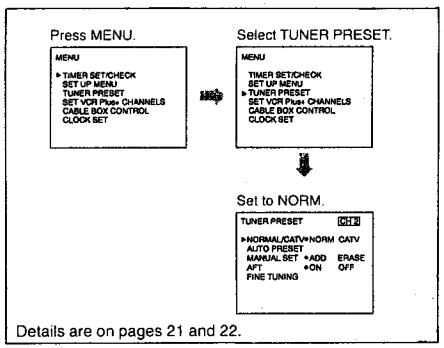
Details are on page 64.

VCR Setup

1 Set the RF UNIT on the VCR's rear panel to CH3 or CH4.
If you made A/V connections, skip this step.

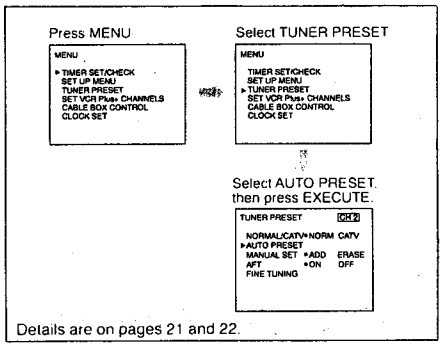


2 Set NORMAL/CATV to NORM.



Details are on pages 21 and 22.

3 Preprogram the channels into the VCR.

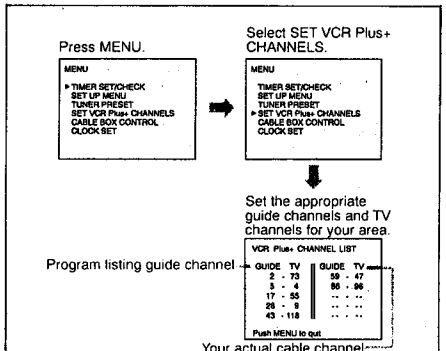


Details are on pages 21 and 22.

VCR Plus+ Channel Setup

1 Find the VCR Plus+ Channel Listing in your program guide.
For details, see page 44.

2 If the channels in the program guide are different from the channels that you actually use on your TV, set the channels that are different as follows:



Details are on page 45.

To Watch the TV

1 Turn your VCR off, or press the VCR's TV/VTR button until the VTR indicator in the display window goes off.
2 Tune the TV normally.

To Watch the VCR

1 Tune the TV to CH 3 or CH 4, whichever you set on the back of the VCR. (If you made the A/V connections on page 7, set your TV to the A/V input instead.)
2 Insert a cassette and press ▶ PLAY. If there's no picture on your TV, press the VCR's TV/VTR button until the VTR indicator comes on in the VCR display window.

Details are on page 30.

To Record a Program

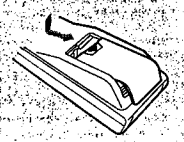
1 Press VCR Plus · on the Remote Commander.
2 Enter the program's Plus Code number.
3 Press ONCE, DAILY, or WEEKLY on the Remote Commander.
4 Insert a blank casette.
5 Press TIMER REC on the Remote Commander.

Details are on pages 46.

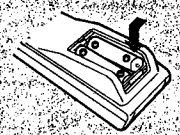
Preparing the Remote Commander/Selecting Language

Inserting Batteries

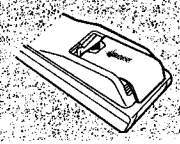
1 Open the lid.



2 Insert two size AA (IEC designation R6) batteries with the polarity lined up correctly.



3 Close the lid.



Notes on the handling of batteries

- With normal use, the batteries should last for approximately six months.
- If you do not use the Remote Commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
- Do not use a new battery together with an old one.
- Do not mix different types of batteries.

Operating the VCR with the Remote Commander

Set the [TV] / [VTR] remote control selector at the top of the Remote Commander to "VTR".

If you are using a Sony TV

You can use the VCR's Remote Commander to operate the TV. When doing this, slide the [TV] / [VTR] remote control selector to "[TV]". Buttons on the Remote Commander with a dot (•) on or beside them can be used to operate your TV. To operate the VCR, return the [TV] / [VTR] remote control selector to "[VTR]".

How to Use the Remote Commander

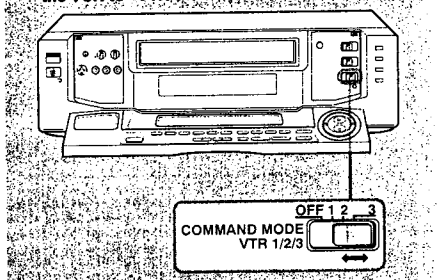
When you operate the VCR using the Remote Commander, point it at the remote sensor located on the VCR. For the location of the remote sensor, see "Identifying the Parts and Controls" on page 65.

When using the Remote Commander to change channels on a cable box, with the VCR's Cable box control feature turned on, point the Remote Commander at the VCR, not the cable box. For best results, separate the VCR and cable box.

Setting the Command Mode

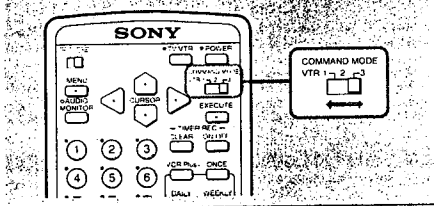
You can select three different positions for the Command Mode setting.

1 Set the COMMAND MODE VTR 1/2/3 selector on the VCR to "VTR 3".

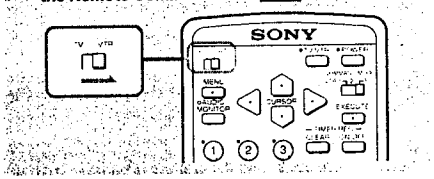


Note
If you set the COMMAND MODE VTR 1/2/3 selector on the VCR to "OFF", you can no longer control this VCR from any other Sony Remote Commanders.

2 Set the COMMAND MODE VTR 1/2/3 selector on the Remote Commander to "VTR 3".



3 Set the [TV] / [VTR] remote control selector on the Remote Commander to "[VTR]".



Selecting Language (Only for Canadian version)

You can set your VCR to display screen information in either English or French.

1 **Press MENU**
The main MENU appears.

```
MENU

▸TIMER SET/CHECK
 SET UP MENU
 TUNER PRESET
 SET VCR Plus+ CHANNELS
 CABLE BOX CONTROL
 CLOCK SET
```

2 **Press ▲ or ▼ to move the cursor to SET UP MENU.**

```
MENU

 TIMER SET/CHECK
▸SET UP MENU
 TUNER PRESET
 SET VCR Plus+ CHANNELS
 CABLE BOX CONTROL
 CLOCK SET
```

3 **Press EXECUTE.**
The SET UP MENU screen appears.

```
SET UP MENU
▸LANGUAGE      •ENGLISH FRENCH
 AUTO ANT SEL  •ON      OFF
 AUTO STEREO   •ON      OFF
 AUDIO MIX      ON      •OFF
 NORMAL AUDIO  •MAIN    SAP
 LANG MODE      M       •S
 LINE IN 1 VIDEO •STD   S
 LINE IN 3 VIDEO •STD   S
 AUTO DISPLAY  •ON      OFF
```

4 **Press ◀ or ▶ to select "ENGLISH" or "FRENCH".**

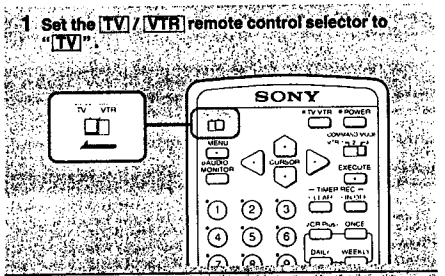
```
SET UP MENU
▸LANGUAGE      •ENGLISH FRENCH
 SÉL AUTO ANT  •OUI     NON
 STÉRÉO AUTO   •OUI     NON
 MÉLANGE AUDIO  OUI     •NON
 AUDIO NORMAL  •PRIN    SAP
 MODE LANC      M       •S
 ENTREE VIDEO 1 •STD    S
 ENTREE VIDEO 3 •STD    S
 AFFICHAGE AUTO •OUI    NON
```

5 **Press EXECUTE.**

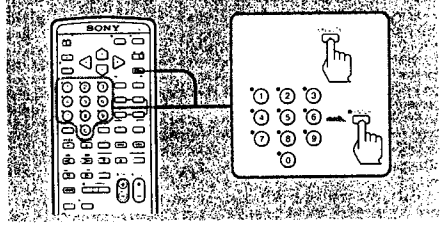
Setting the Remote Commander to Control Other Manufacturers' TV Sets

The following steps show you how to use your Remote Commander to set the appropriate manufacturer's code number for a non-Sony TV. (Code numbers are listed on the next page.)

1 Set the [TV] / [VTR] remote control selector to "[TV]".



2 While pressing the EXECUTE button, press the manufacturer's code number and the ENTER button.
You can now use the POWER, VOL +/–, CHANNEL +/– and the TV/VTR buttons on your Remote Commander to operate the TV.



NOTES:

- The TV/VTR button may not function, depending on the manufacturer. If this problem occurs, use your TV's remote control unit.
- If more than one code number is listed, try entering them one at a time until you find the one that works with your TV.
- If you enter a new code number, the code number previously entered will be erased.
- If you release the EXECUTE button before pressing the ENTER button, the setting will be cancelled.
- Some manufacturers may use a different remote control system from the one programmed to work with your VCR. If this is the case, and you are unable to operate the TV with your Remote Commander, use the TV's remote control unit instead.
- When you replace the batteries in the Remote Commander, the code number automatically resets to 1 (SONY). Reset the appropriate code number, if necessary.

Preparing the Remote Commander/Selecting Language

Controlling Other Sony Video Equipment If Other Sony Video Equipment Has a COMMAND MODE Selector:

1 **Set the Remote Commander COMMAND MODE 1/2/3 selector to a position other than the one you selected for this VCR.**

2 **Set the COMMAND MODE selector of any other video equipment to the same position you selected in step 1.**

If other Sony video equipment does not have a COMMAND MODE selector, you can control other Sony video equipment using the following COMMAND MODE settings:

Infrared remote controlled Sony Betamax VCRs: position 1
(Some may not be controlled in this mode.)

Sony 8 mm format VCRs: position 2

Sony VHS format VCRs: position 3

Manufacturers and their Code Numbers

Your Remote Commander is preprogrammed for use with a number of different TV sets. If your TV is listed in the table below, set the appropriate manufacturer's code prior to using the Remote Commander.

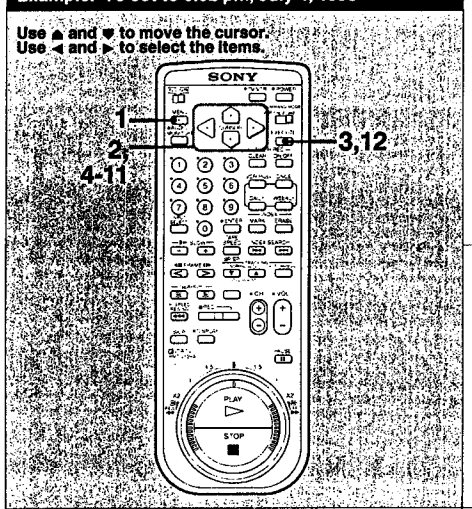
Manufacturer	Code Number	Manufacturer	Code Number
SONY	1	Philco	3, 4
Akai	4	Philips	8
AOC	4	Pioneer	16
Centurion	12	Portland	3
Coronado	3	Quasar	6
Curtis-Mathes	12	Radio Shack	5, 14
Daytron	12	RCA	4, 10
Fisher	11	Sampo	12
General Electric	6, 10	Sanyo	11
Hitachi	2, 3	Scott	12
J.C.Penney	4, 12	Sears	7, 10, 11
JVC	9	Sylvania	8, 12
KMC	3	Teknika	3, 8, 14
Magnavox	3, 8, 12	Toshiba	7
Marantz	4, 13	Wards	3, 4, 12
MGA/Mitsubishi	4, 12, 13, 17	Yorx	12
NEC	4, 12	Zenith	15
Panasonic	6	Sharp	3, 5, 18

Setting the Time and Date

You can set the VCR time and date on the TV screen using the Remote Commander.

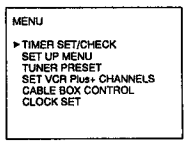
Example of Time and Date Setting

Example: To set to 3:32 pm, July 4, 1993

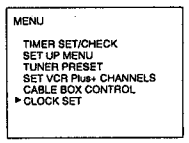


1 Press MENU.

The main MENU appears.

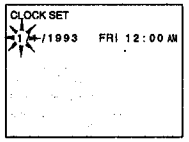


2 Press ▲ or ▼ to move the cursor (▶) to CLOCK SET.

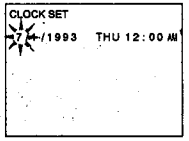


3 Press EXECUTE.

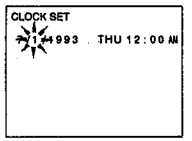
"1/1 1993 FRI 12:00 AM" is displayed. The leftmost 1, in the "month" position, flashes.



4 Press ▲ or ▼ until "7" appears in the month position.

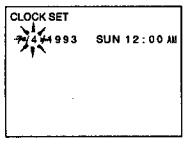


5 Press ▶ to make the next number in the "day" position flash.



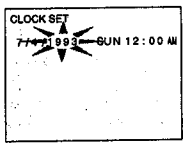
6 Press ▲ or ▼ until "4" appears in the "day" position.

The day of the week is set automatically.

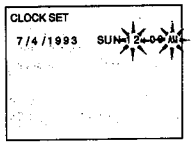


Setting the Time and Date

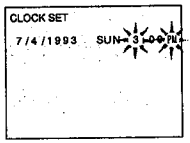
7 **Press ▶ to make the "year" position flash and press ▲ or ▼ to change the year.**
If you want to leave the year indication unchanged, just press ▶.



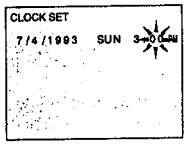
8 **Press ▶ to make the "time" position flash.**



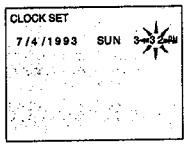
9 **Press ▲ or ▼ until "3 PM" appears.**



10 **Press ▶ to make the "minutes" position flash.**



11 **Press ▲ or ▼ until "32" appears in the minutes position.**



12 **Press EXECUTE.**
Pressing EXECUTE will set the clock to 3:32 pm 00 seconds.

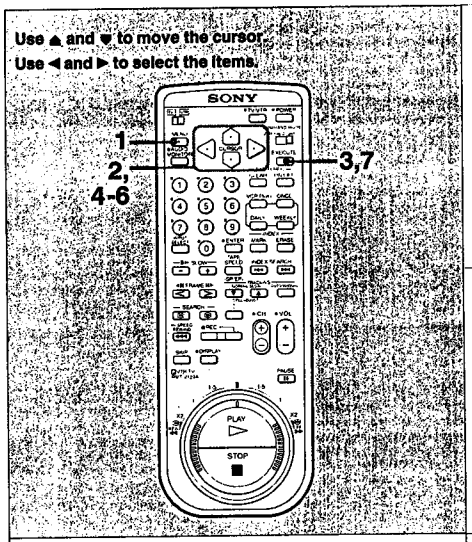
NOTES:
- Do not set the time and date during timer-activated recording, timer recording standby or quick-timer recording.
- When the time and date clock is displayed, the clock keeps running as long as no changes are made. The seconds are not reset to 00 when you return to the original screen.

Presetting the Active Channels

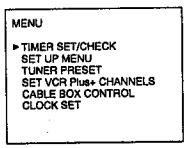
This VCR is capable of receiving VHF channels 2 to 13, UHF channels 14 to 69 and CATV channels 1 to 125. These channels can be preset using the Remote Commander and the TUNER PRESET display. First, we recommend that you preset the active channels in your area using the automatic preset mode. Then, if there are any unwanted channels, disable them manually. If you have already decided which channels you wish to preset on the VCR, set them directly using the channel number buttons.

Before presetting channels, check the following points:
- Turn on the VCR and the TV.
- If you have connected the TV and the VCR using the VHF/UHF OUT on the VCR only, make sure that the TV is set to the correct channel (CH 3 or CH 4) for the VCR.
  If you have connected the TV and the VCR using the LINE OUT, select the input for the VCR.
- Press TV/VTR so that the VTR indicator lights up in the display window on the VCR.
- Press INPUT SELECT so that the TUNER indicator appears in the display window on the VCR.
- It is not necessary to use the TUNER PRESET function if the CABLE BOX CONTROL is set to "ON." If you want to use the TUNER PRESET function, make sure the CABLE BOX CONTROL is set to "OFF."

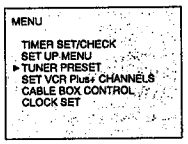
Presetting All Receivable Channels Automatically



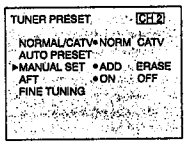
1 **Press MENU.**
The main MENU appears.



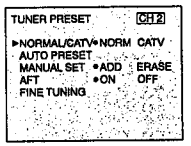
2 **Press ▲ or ▼ to move the cursor (▶) to TUNER PRESET.**



3 **Press EXECUTE.**
The TUNER PRESET menu is displayed.

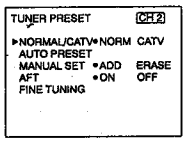


4 **Press ▲ or ▼ to move the cursor to NORMAL/CATV.**

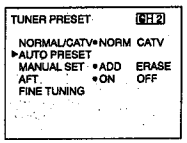


5 Press ◄ or ► to select "NORM" or "CATV".

NORM presets the VHF and UHF channels; CATV presets your cable TV channels. The lowest channel number, 2 for NORM and 1 for CATV, will appear on the screen.



6 Press ▲ or ▼ to move the cursor to AUTO PRESET.



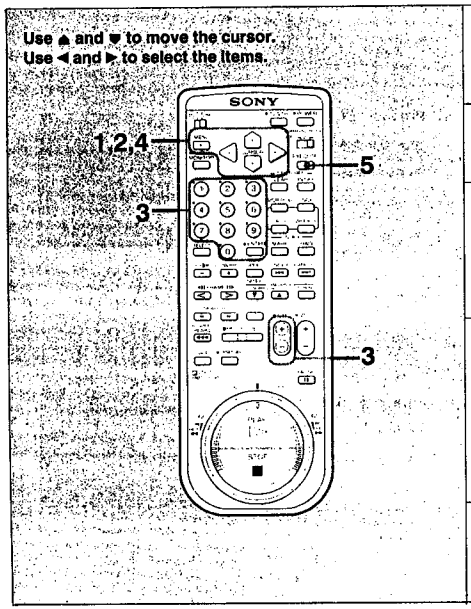
7 Press EXECUTE.

Receivable channels are preset in numerical sequence. When no more channels can be found, the presetting stops and the picture of the lowest numbered channel is displayed on the TV screen.

NOTE:
The VCR automatically exits from the TUNER PRESET menu if you don't proceed for more than one minute.

Presetting Desired Channels or Disabling Unwanted Channels

After automatic presetting, you can disable and/or add channels.

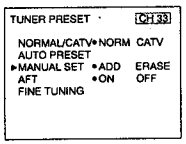


1 Follow steps 1 to 3 in "Presetting All Receivable Channels Automatically" on page 21.

2 Press ▲ or ▼ to move the cursor to MANUAL SET.

3 To disable channels, press CH +/– to select the channel.
To add channels, press channel number buttons (0 to 9) and then ENTER key to select the channel.

4 To disable channels, press ◄ or ► to select "ERASE".
To add channels, press ◄ or ► to select "ADD".



5 Press EXECUTE.

When you press CH +/–, the disabled channels are removed and the added channels are displayed.

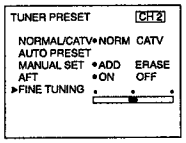
Fine-tuning

Normally, the Auto Fine Tuning (AFT) setting on the TUNER PRESET menu is set to "ON", and the AFT function fine-tunes the picture. If the picture of a channel is not acceptable, fine-tune it manually.

1 Display the TUNER PRESET menu referring to steps 1 to 3 in "Presetting All Receivable Channels Automatically" (page 21).

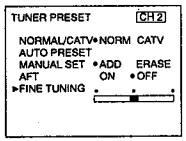
2 Press ▲ or ▼ to move the cursor to FINE TUNING.

The fine tuning indicator is displayed.

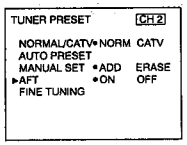


3 Press ◄ or ► to get a clearer picture.

The AFT ON/OFF automatically switches to "OFF".



4 If you cannot get a better picture, press ▲ or ▼ to move the cursor to AFT and select "ON". Then, press EXECUTE.



The FINE TUNING indicator

The FINE TUNING indicator shows the operable fine-tuning range and stops at the optimal point of reception. When a broadcast is received in an optimal condition, the indicator may not be at the center position.

Cable TV Channel Assignment

Cable TV systems use letters or numerals to designate the channels. To tune-in a CATV channel, refer to the chart below which shows the CATV channel numbers on this VCR and the corresponding CATV channel. Note that the channel number assignment shown in the chart may not correspond to the channel number used by your local cable company. Check with your local cable TV company for more information on the available channels.

Number of this VCR	1	2	...	13	14	15	16	17	18
Corresponding CATV channel	A-8	2	...	13	A	B	C	D	E

19	20	21	22	23	24	25	26	27	28	29	30	31	32
F	G	H	I	J	K	L	M	N	O	P	Q	R	S

33	34	35	36	37	...	94	95	96	97	98	99
T	U	V	W	W+1	...	W+58	A-5	A-4	A-3	A-2	A-1

100	...	125
W+59	...	W+84

This VCR is designed to correspond to the standard cable system. However, the cable TV services may vary from area to area. Your local cable TV company may adopt either the HRC 1 or IRC 2 cable system. This VCR is capable of receiving either of these cable systems in the best condition.

1) **HRC (Harmonic Related Carriers)**
All channels except for 5 and 6 are 1250 kHz lower than the standard cable system. Channels 5 and 6 are 750 kHz higher than the standard cable system.

2) **IRC (Incremental Related Carriers)**
All channels except for 5 and 6 are the same as the standard cable system. Channels 5 and 6 are 2000 kHz higher than the standard cable system.

FINE TUNING indicator for receiving HRC or IRC cable systems

Even when the signals are received in optimal condition, the FINE TUNING indicator will not stay at the center position for channels higher or lower than the standard cable system due to the difference in the frequency.

NOTE:
Many cable TV systems use scrambled or encoded signals for certain channels, usually premium or pay-per-view channels.
A cable box is necessary to receive scrambled channels.

Activating the Cable Box Control Function

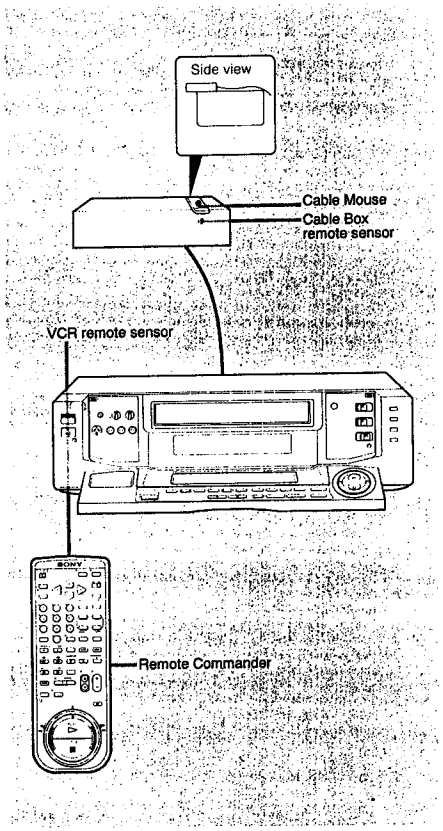
Your VCR includes a Cable Box Control feature that allows the VCR to control channel selection on most cable boxes.

Compatible cable box brands are shown on page 26.

The CABLE BOX CONTROL must be set to "ON", and the code number and the output channel must be set to match your cable box before you can use it. For details on connecting your cable box to the VCR to control the cable box with the Remote Commander, please refer to Hookup 2 on page 8.
When CABLE BOX CONTROL is set to "ON", the VCR will control the cable box channel for timer recording. In addition, you can use the VCR's Remote Commander to change channels on the cable box whenever the cable box and the VCR are turned on.

Note
Do not place the cable box on top of the VCR. For best results, place the cable box as far away from the VCR as possible.

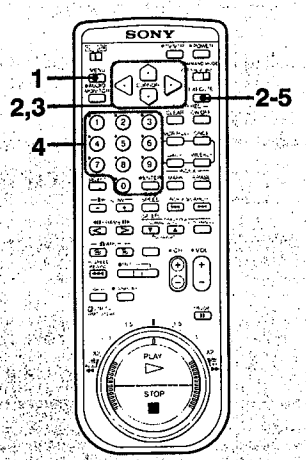
Note on setting the cable box and Cable Mouse
Make sure that the Cable Mouse is positioned near to and above the sensor on the cable box so that the signal from the Cable Mouse is received correctly.
The cable box should not be too close to the VCR.



Setting the Cable Box Control

To use the cable box control function, enter the cable box code number and select the cable box output channel as explained below.

Use ▲ and ▼ to move the cursor.
Use ◀ and ▶ to select items.



1 Press MENU.
The main MENU appears.

MENU
▸TIMER SET/CHECK
SET UP MENU
TUNER PRESET
SET VCR Plus+ CHANNELS
CABLE BOX CONTROL
CLOCK SET

2 Press ▲ or ▼ to move the cursor (▶) to CABLE BOX CONTROL, then press EXECUTE.

MENU
TIMER SET/CHECK
SET UP MENU
TUNER PRESET
SET VCR Plus+ CHANNELS
▸CABLE BOX CONTROL
CLOCK SET

3 Press ◀ or ▶ to select "ON," then press EXECUTE.

CABLE BOX CONTROL
•ON OFF
Use◀ ▶ to select
Push EXECUTE for first time setup
Push MENU to quit

4 Enter the cable box code number under CABLE BOX Code No. as listed in the chart on page 26, then press EXECUTE.

Your CABLE BOX Code No.
Enter your CABLE BOX Code No.using 0-9 keys
Refer to the Operating Manual for the Code
Then push EXECUTE

5 Select the cable box output channel under CABLE BOX OUTPUT CH, then press EXECUTE.

Your CABLE BOX Output CH
•CH2
CH3
CH4
LINE [LINE IN 1 on VCR]
Use ▲ ▼ to select CABLE Box CH.Then push EXECUTE

Activating the Cable Box Control Function

Cable box code number chart

In step 4 on page 25, enter the code number of your cable box as listed in the chart below.

Brand	IR Code No.
Hamlin	14, 15
Jerrold/General Instrument	1, 2, 3, 4
Oak	17, 18
Panasonic	12, 13
Philips	22
Pioneer	8, 9
Regal	14, 15
Regency	20
Scientific Atlanta	5, 6
Tocom	10, 11
Zenith	7

The VCR contains 42 cable box codes (1 – 42). If your cable box is not listed in the chart, it may be possible to control it using one of the other (1 – 42) codes. You may want to try other codes before calling your cable company to see if they can supply a cable box that is in the chart.

If your cable box is listed in the chart, but does not respond, first check the placement of the "Cable Mouse" (see page 24), and try placing the cable box and VCR away from each other (do not place the cable box directly on top of the VCR). If the cable box still does not respond, you can try other codes.

Checking the Cable Box Control Setting

Using the information provided below, check to make sure that you have made the correct Cable Box Control setting.

Note

Make sure to do the following when using a cable box.

- Tap the buttons on the Remote Commander lightly. Do not hold the buttons down.
- Do not place the cable box on top of the VCR. Position the cable box away from the VCR. Do not point the Remote Commander at the cable box. Point it at the VCR.

1 Press CH +/– on the Remote Commander.
Does the channel indicator on the cable box change?
2 Press all 10 channel number buttons on the Remote Commander (0 to 9). Does the channel indicator on the cable box change?

If the answer to both **1** and **2** is "yes", you have made the correct setting.

If you cannot get your VCR to control the cable box

Try the setup again making sure to use the correct code number.

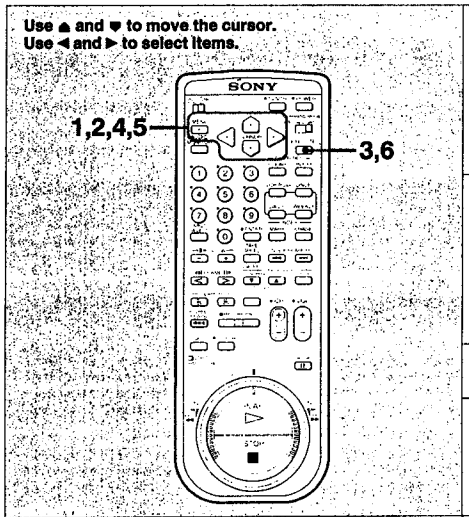
If, after checking your setup, you are sure that the VCR will not control your cable box, contact your cable company. They may be able to supply a compatible cable box.

Note

Even if your cable box brand is listed, it is possible that the VCR may not control your specific cable box. This can happen if the cable box is very old or the cable box manufacturer has designed a new box with new channel code after your VCR was manufactured.
If this is the case, contact your cable company.
They may be able to supply a compatible cable box.

Using The SET UP MENU

Before using your VCR, make your preferred audio and video display choices from the SET UP MENU.



1 Press MENU.
The main MENU appears.

```
MENU
► TIMER SET/CHECK
  SET UP MENU
  TUNER PRESET
  SET VCR Plus+ CHANNELS
  CABLE BOX CONTROL
  CLOCK SET
```

2 Press ▲ or ▼ to move the cursor (►) to SET UP MENU.

```
MENU
  TIMER SET/CHECK
► SET UP MENU
  TUNER PRESET
  SET VCR Plus+ CHANNELS
  CABLE BOX CONTROL
  CLOCK SET
```

3 Press EXECUTE.
The SET UP MENU appears.

```
SET UP MENU
  LANGUAGE=ENGLISH FRENCH
► AUTO ANT SEL   •ON  OFF
  AUTO STEREO    •ON  OFF
  AUDIO MIX       ON •OFF
  NORMAL AUDIO   •MAIN SAP
  LANG MODE       M  •S
  LINE IN 1 VIDEO •STD S
  LINE IN 3 VIDEO •STD S
  AUTO DISPLAY   •ON  OFF
```

4 Press ▲ or ▼ to move the cursor to the desired menu choice. (For Menu Choices, see the next page.)

```
SET UP MENU
  LANGUAGE=ENGLISH FRENCH
► AUTO ANT SEL   •ON  OFF
  AUTO STEREO    •ON  OFF
  AUDIO MIX       ON •OFF
  NORMAL AUDIO   •MAIN SAP
  LANG MODE       M  •S
  LINE IN 1 VIDEO •STD S
  LINE IN 3 VIDEO •STD S
  AUTO DISPLAY   •ON  OFF
```

5 Press ◄ or ► to move the dot (•) to the desired setting.

6 Press EXECUTE to return to the original screen.
The settings are stored. The displayed page is stored unless the power plug is disconnected.

Menu Choices

LANGUAGE (Canadian versions only)
You can preset your VCR to display screen information in either English or French.

AUTO ANT SEL (Automatic Antenna Selector)

- If your TV is connected only to VHF/UHF OUT on the VCR, set to "ON".

When playing back a cassette, the picture is automatically displayed on the screen simply by selecting the channel for the VCR on the TV. To watch TV programs selected on the TV, press TV/VTR to turn off the VTR indicator in the display window.

- If your TV is connected to both VHF/UHF OUT and LINE OUT on the VCR, set to "OFF".

When playing back a cassette, select the input for the VCR on the TV.
To watch TV programs selected on the TV, select the tuner input.

AUTO STEREO
If a stereo program's reception is poor, set to "OFF". The program is recorded in monaural but sound quality may improve. For details, see page 36.

AUDIO MIX
To listen to sound recorded on both the Hi-Fi video track and the normal audio track of the audio tape, set to "ON". For details, see page 33.

NORMAL AUDIO
When there is a SAP (Second Audio Program) broadcast, select "SAP" to record the SAP sound on the normal audio track. For details, see page 33.

LANC MODE
If you want to control another VCR with the control L connector, set to "M" (Master). If you want the VCR controlled by another VCR or editing controller, set to "S" (Slave). (For details, see page 58.)

LINE IN 1 VIDEO
When you connect the video output jack of the other VCR to the LINE IN 1 VIDEO input jack of this VCR, select "STD". When you connect the S VIDEO output connector of the other VCR to the LINE IN 1 S VIDEO input connector of this VCR, select "S".

LINE IN 3 VIDEO
When you connect the video output jack of the other VCR to the LINE IN 3 VIDEO input jack of this VCR, select "STD". When you connect the S VIDEO output connector of the other VCR to the LINE IN 3 S VIDEO input connector of this VCR, select "S".

AUTO DISPLAY
Normally select "ON". In this case, the on-screen display will appear on the TV screen for about five seconds each time the operation mode of the VCR is changed.
Select "OFF" when you want to play back on this VCR and record on the other VCR. This eliminates the on-screen display so that it will not appear on the TV screen.

NOTE:
The VCR automatically exits from the main MENU and SET UP MENU if you don't proceed for more than one minute.

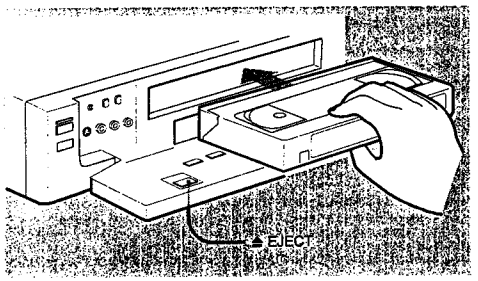
Playback

This section shows you how to play back a video cassette.

Inserting a Video Cassette

1 Insert a video cassette as shown below.

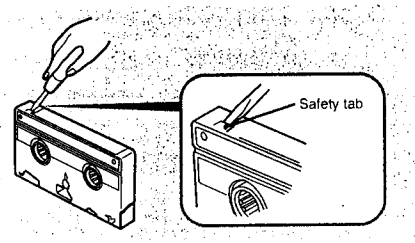
2 Gently press the center of the front side of the cassette until the mechanism draws it into the compartment.
When the cassette has been loaded, the cassette indicator ( ) lights up in the display window and the VCR turns on automatically.



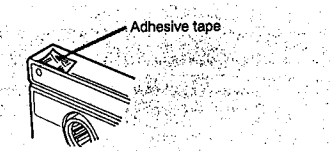
NOTE:
If you insert a cassette without a safety tab, playback starts automatically (auto playback function).

Ejecting the cassette
Press ⏏ EJECT on the VCR.
You can eject the cassette when the power is off.
When you press ⏏ EJECT, the power is turned on. After ejecting the cassette, the power automatically shuts off.

Protecting your cassettes against accidental erasure
Cassettes have a safety tab to protect against accidental recording. Break off the safety tab with a screwdriver or other tool. If the safety tab is removed, the cassette will be ejected when you try to record on it.



To record on a cassette with the safety tab broken off, simply cover the tab hole with adhesive tape.



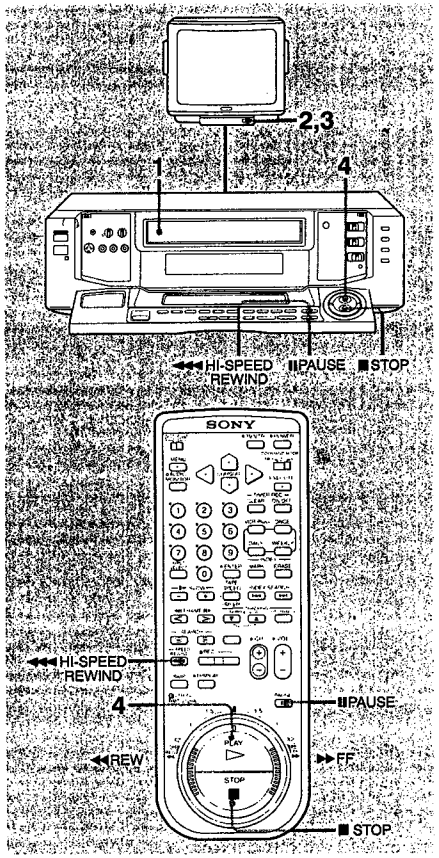
Maximum recording time of a cassette
Recording in either the SP or EP mode is possible with this VCR. When recording, select the desired recording speed (SP or EP) using TAPE SPEED on the Remote Commander. During playback, the VCR automatically detects the recording format, and then plays back the cassette in the appropriate mode. A cassette recorded in the EP mode runs three times as slowly as a cassette recorded in the SP mode. Refer to the chart below for the recording/playback times available.

Cassette tape	Recording/Playback time	
	SP mode	EP mode
T-180	3 h	9 h
T-160	2 h 40 min	8 h
T-120	2 h	6 h
T-60	1 h	3 h
T-30	30 min	1 h 30 min

Cassettes recorded in LP mode
Playback of cassettes recorded in LP mode is also possible with this VCR. However, playback in modes other than normal forward speed is not guaranteed. This VCR is not designed to record in the LP mode.

Playback

The VCR automatically detects the type of video format in which the tape was recorded (S-VHS format or VHS format) and the recording tape speed mode in which the tape was recorded (SP mode, LP mode or EP mode), and plays back the tape accordingly. When a tape recorded in the S-VHS format is played back, the S-VHS indicator will appear in the display window of the VCR regardless of the S-VHS ON/OFF switch setting.



1 Insert a cassette.

2 Turn on the TV.

3 If your TV is connected to both VHF/UHF OUT and LINE OUT 1 or 2 on the VCR, select the input for the VCR. If your TV is connected only to the VHF/UHF OUT on the VCR, select the channel for the VCR (CH 3 or CH 4).

4 Press ▶ PLAY.

To stop playback:
Press ■ STOP.

To stop playback for a moment:
Press ❚❚ PAUSE.
Press ❚❚ PAUSE again or ▶ PLAY to resume playback.

To fast-forward the cassette at high speed during stop mode:
Turn the DUAL MODE SHUTTLE ring to the right (▶▶).

To rewind the cassette during stop mode:
Turn the DUAL MODE SHUTTLE ring to the left (◀◀).

To rewind the cassette at high speed
Press ◀◀◀ HI-SPEED REWIND.

To rewind the cassette to its beginning and to playback automatically (auto playback function):
You cannot use the Remote Commander for the auto playback function.
Press ▶ PLAY while depressing ◀◀◀ HI-SPEED REWIND or while fully turning the DUAL MODE SHUTTLE ring to the left (◀◀).

When the cassette reaches the end:
The cassette automatically rewinds to the beginning (auto rewind), and power remains on.

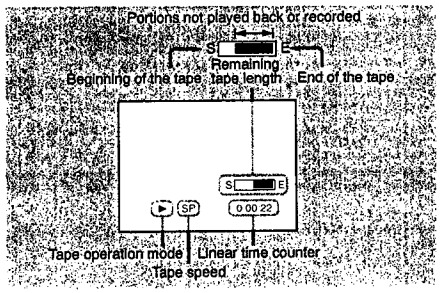
NOTES:

- When the TV is connected only to the VHF/UHF OUT on the VCR, you cannot hear the program in stereo.
- In order to hear stereo playback, it is necessary to connect the L/R audio out connections of the VCR to a stereo monitor TV, or stereo audio system.

The On-Screen Display

You can use the on-screen display function in two modes, AUTO DISPLAY ON mode and AUTO DISPLAY OFF mode. You can select the desired mode by using the SET UP MENU screen. (For details, see pages 27 and 28.)

Activated on-screen display function mode	Each time DISPLAY on the Remote Commander is pressed.	
AUTO DISPLAY ON mode	The corresponding VCR operation mode display will appear for about five seconds on the TV screen when the VCR enters the other operation mode.	In addition to the left the current date and time, remaining tape length, linear time counter will appear on the TV screen.
AUTO DISPLAY OFF mode	No display is shown on the TV screen.	Same as above.

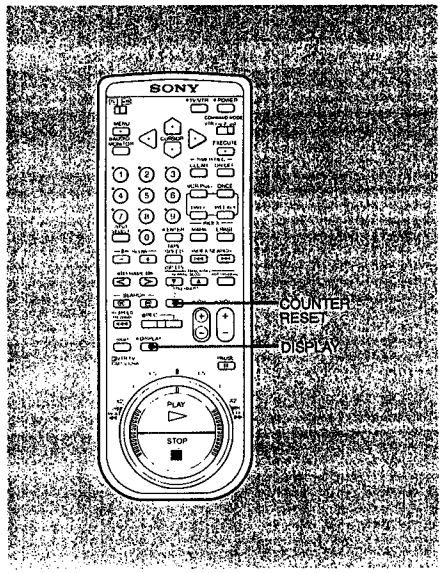


NOTES:

- The remaining tape length displayed is approximate. Therefore, use it only as an approximate reference.
- When you insert a cassette with a short tape length such as T-20, T-30 or a non-standard commercially available cassette, this indicator may not function correctly.
- The data screen display cannot be displayed on the screen during still mode, slow motion playback.

Indexing Tape Contents

When a cassette is inserted, the clock display will be automatically switched to the counter display and the counter reading "0H00M00S" will appear in the display window. If you want , however, to reset the counter to zero, press COUNTER RESET on the Remote Commander. By noting the setting, you can find that point later by referring to the counter. Use the label on the cassette to list the programs and their counter readings.

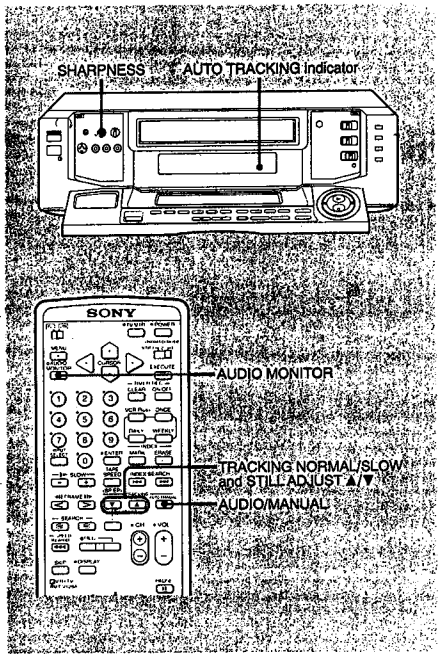


NOTES ON COUNTER READING:

- After a cassette is ejected, the counter display will be automatically switched to the clock display. When a cassette is reinserted the counter display will appear and show the counter reading "0H00M00S".
- The counter does not work properly on the portions on which no recording has been made.

Playing Back Externally-Recorded Tapes

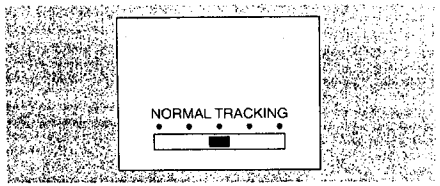
When playing back a cassette that was recorded on another VCR, the tracking condition is automatically adjusted and the picture sharpness is set to an optimum condition. You can also adjust the tracking condition manually according to the following instructions.



Manual tracking adjustment

When the playback picture has streaks or snow during normal playback, adjust the picture manually with TRACKING NORMAL/SLOW and STILL ADJUST ▼/▲.

Press either ▲ or ▼ for the best possible picture. The tracking meter will appear on the TV screen and the AUTO TRACKING indicator will turn off.



Automatic tracking adjustment

The tracking condition is automatically adjusted on this VCR. The AUTO TRACKING indicator flashes while the VCR is searching for the optimal tracking condition and lights when the optimum playback picture is obtained. The automatic tracking control is activated in the following conditions:

- When the cassette is inserted for the first time
- When the recording mode on the playback cassette is switched from SP to EP and back again
- When the picture is distorted by scratches on the tape
- When the AUTO TRACKING indicator is turned on by pressing TRACKING AUTO/MANUAL after the picture is adjusted manually

NOTES:

- Auto tracking adjustment is not possible for cassettes recorded in LP mode.
- When the recording condition of the cassette is poor, auto tracking adjustment may be impossible and the tracking indicator may not appear on the TV screen.
- During auto tracking adjustment, streaks or noise may occur.

Adjusting the sharpness

Turn SHARPNESS toward SHARP to get a sharper picture. Turn it toward SOFT to get a softer picture.

Selecting the Monitor Sound

You can play back cassettes on which stereo sound or bilingual programs are recorded.
Press AUDIO MONITOR to select the desired sound mode. Each press of the button changes the display on the TV.

NOTE:

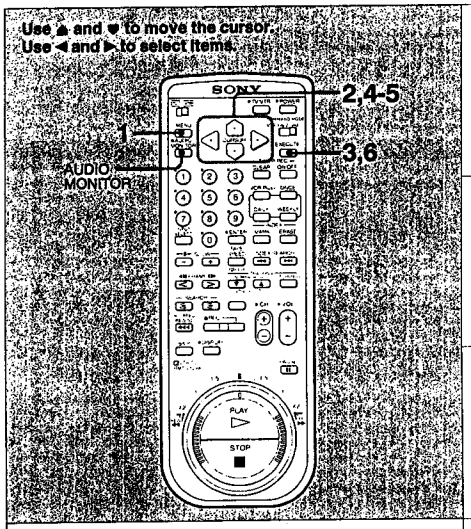
When you play back a cassette recorded in monaural, the sound is heard in monaural regardless of the setting of the AUDIO MONITOR.

Sound Mode

Display	On-screen Display	Sound heard	
		Stereo tape	Bilingual tape
STEREO	STEREO	Stereo	Left and right channels
MAIN/L	Lch	Left channel	Left channel
SUB/R	Rch	Right channel	Right channel
None	None	Monaural on normal audio track	Sound on normal audio track (SAP)

Listening to Mixed Hi-Fi and Normal Track Sound

You can hear sound recorded on the hi-fi video track and the normal audio track simultaneously. This allows you to listen to an audio-inserted cassette.



1 Press MENU.
The main MENU appears.

MENU
▶TIMER SET/CHECK
SET UP MENU
TUNER PRESET
SET VCR Plus+ CHANNELS
CABLE BOX CONTROL
CLOCK SET

2 Press ▲ or ▼ to move the cursor (▶) to SET UP MENU.

MENU
TIMER SET/CHECK
▶SET UP MENU
TUNER PRESET
SET VCR Plus+ CHANNELS
CABLE BOX CONTROL
CLOCK SET

3 Press EXECUTE.
The SET UP MENU appears.

SET UP MENU

▶AUTO ANT SEL	•ON	OFF
AUTO STEREO	•ON	OFF
AUDIO MIX	ON	•OFF
NORMAL AUDIO	•MAIN	SAP
LANC MODE	M	•S
LINE IN 1 VIDEO	•STD	S
LINE IN 3 VIDEO	•STD	S
AUTO DISPLAY	•ON	OFF

4 Press ▲ or ▼ to move the cursor to AUDIO MIX.

SET UP MENU

AUTO ANT SEL	•ON	OFF
AUTO STEREO	•ON	OFF
▶AUDIO MIX	ON	•OFF
NORMAL AUDIO	•MAIN	SAP
LANC MODE	M	•S
LINE IN 1 VIDEO	•STD	S
LINE IN 3 VIDEO	•STD	S
AUTO DISPLAY	•ON	OFF

5 Press ◀ or ▶ to move the dot (•) to "ON".

SET UP MENU

AUTO ANT SEL	•ON	OFF
AUTO STEREO	•ON	OFF
▶AUDIO MIX	•ON	OFF
NORMAL AUDIO	•MAIN	SAP
LANC MODE	M	•S
LINE IN 1 VIDEO	•STD	S
LINE IN 3 VIDEO	•STD	S
AUTO DISPLAY	•ON	OFF

6 Press EXECUTE to return to the original screen.

NOTES:

- When you set AUDIO MIX to "ON", the AUDIO MONITOR button does not function.
- Reset to "OFF" after listening to the sound in audio mix mode.

Recording TV Programs

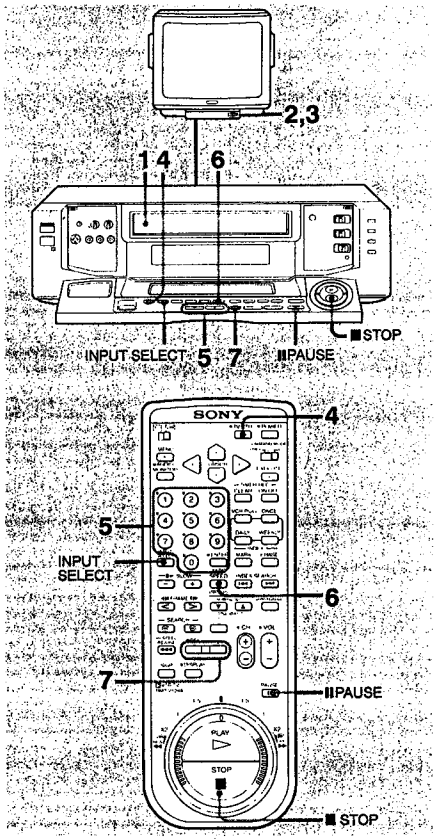
Before you begin, check the following points:

- Make sure that the connections have been made correctly (see pages 6 to 15).
- Check the input mode indicator in the display window of the VCR.
  Press INPUT SELECT so that the LINE indicator disappears and the TUNER indicator appears in the display window.
  Check that the REC LEVEL control is set to the 5 position.

CAUTION:
Television programs, films, video cassettes and other materials may be copyrighted. Unauthorized recording of such materials may be contrary to the provisions of the copyright laws. Also, use of this recorder with cable television transmission may require authorization for the cable television and/or program owner.

Recording TV Programs

You can record in the S-VHS format or the VHS format using an S-VHS tape. Normally you should set the S-VHS ON/OFF switch to ON. However, if you intend to play back on another VHS format recorder, set the S-VHS ON/OFF switch to OFF. (For details, see page 4.)



1 Insert a cassette.
The VCR turns on automatically (auto power on).

2 Turn on the TV.
If you are using a cable box, turn it on.

3 If your TV is connected to both VHF/UHF OUT and LINE OUT 1 or 2 on the VCR, select the input for the VCR.

4 If your TV is connected only to VHF/UHF OUT, set the TV to the correct channel (CH 3 or CH4), then press TV/VTR so that the VTR indicator lights up in the display window.
Skip this step if your VCR is connected to both the VHF/UHF OUT and LINE OUT 1 or 2.

5 Select the channel to be recorded with CHANNEL +/– or the channel number buttons and press ENTER.

6 Select SP or EP with TAPE SPEED (SP/EP).
To select the best recording tape speed, see "Maximum Recording Time of a Cassette" on page 29.

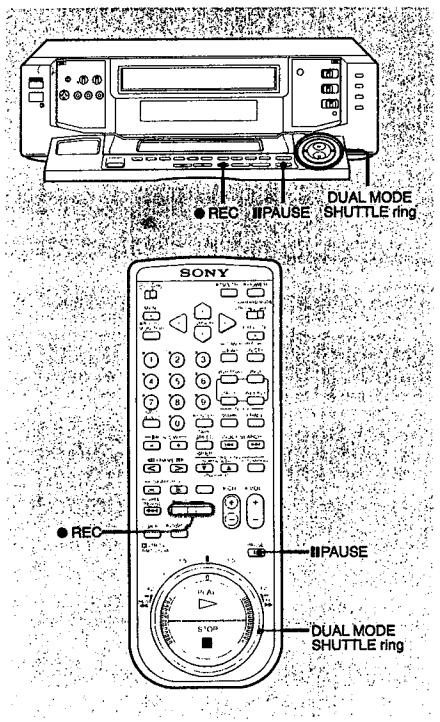
7 Press the two ● REC buttons on the Remote Commander at the same time, or the ● REC button on the VCR.
The REC indicator lights up on the VCR.

To stop recording:
Press ■ STOP.

To pause the cassette:
Press II PAUSE. To resume recording, press II PAUSE. When the recording pause mode lasts for approximately 5 minutes, the VCR enters the stop mode.

When the cassette reaches its end:
The cassette rewinds to the beginning and the power remains on.

Pausing



Technique 1

You can stop recording an unwanted scene and resume recording smoothly.

1 Press II PAUSE when an unwanted scene appears.
Recording will stop and the VCR enters the recording pause mode.

2 Press II PAUSE at the desired point to release the pause mode.
Recording resumes from the point set in step 1.

Technique 2

When an unwanted scene has already started recording, you can return the cassette to the desired point, have the VCR standby in the recording pause mode, and resume recording at the desired scene. **This feature is only available on the VCR, not the Remote Commander.**

1 Press II PAUSE to set the VCR to the recording pause mode.

2 Turn the DUAL MODE SHUTTLE ring to the left to search for the point from which you wish to continue recording.

3 Release the DUAL MODE SHUTTLE ring at the desired point.
After an instant in still mode, the VCR automatically enters the recording pause mode.

4 Press II PAUSE.
Recording resumes.

Recording with the TV Off

Turn off the power of the TV or color monitor.
There will be no interference with the recording.

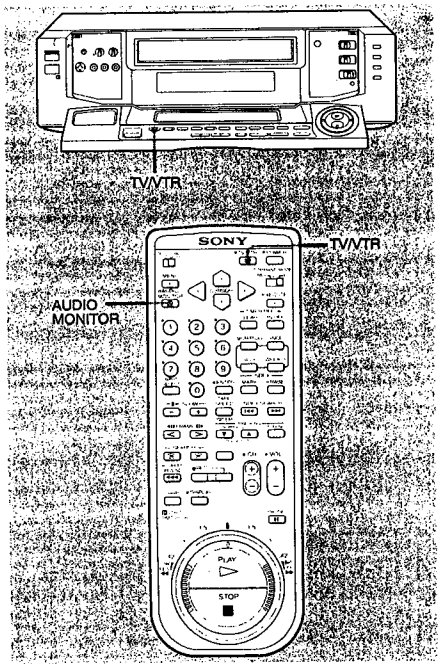
When using a cable box, make sure to leave the power for it set to on.

Watching One TV Program While Recording Another

1 Press TV/VTR so that the VTR indicator goes off.
Skip this step if you have connected the TV and the VCR using the LINE OUT.

2 Select the channel you want to watch on the TV.

VTR Indicator	Picture on the TV Screen
Lit	Channel selected by the VCR or the playback picture of the VCR
Unlit	Channel selected by the TV



Recording Multi-channel TV Sound (MTS) Broadcasts

To record a stereo broadcast:
When a stereo broadcast program is received, the STEREO indicator lights in the display window of the VCR. The stereo program is automatically recorded in stereo. If a stereo program's reception is poor, set AUTO STEREO to "OFF" in the SET UP MENU. (See page 27.) The sound is heard in monaural but the noise is reduced.

SET UP MENU

AUTO ANT SEL	•ON	OFF
▶AUTO STEREO	ON	•OFF
AUDIO MIX	ON	•OFF
NORMAL AUDIO	•MAIN	SAP
LANG MODE	M	•S
LINE IN 1 VIDEO	•STD	S
LINE IN 3 VIDEO	•STD	S
AUTO DISPLAY	•ON	OFF

To record SAP (Second Audio Program) broadcast:
Normally, set NORMAL AUDIO to "MAIN" in the SET UP MENU. The main sound is recorded on the normal track. To record the SAP sound on the normal audio track, set NORMAL AUDIO to "SAP" in the SET UP MENU.

To monitor the SAP sound during recording, press AUDIO MONITOR to light the SAP indicator in the display window of the VCR.

SET UP MENU

AUTO ANT SEL	•ON	OFF
AUTO STEREO	•ON	OFF
AUDIO MIX	ON	•OFF
▶NORMAL AUDIO	MAIN	•SAP
LANG MODE	M	•S
LINE IN 1 VIDEO	•STD	S
LINE IN 3 VIDEO	•STD	S
AUTO DISPLAY	•ON	OFF

NOTES:

- When not recording a SAP broadcast, select "MAIN". If you select "SAP", no sound is recorded on the normal audio track.
- Even if you work on the DUAL MODE SHUTTLE ring during recording, the DUAL MODE SHUTTLE ring is inoperative. To operate it, put the VCR into the recording pause mode with ❚❚ PAUSE or the stop mode with ■ STOP.

Timer Recording

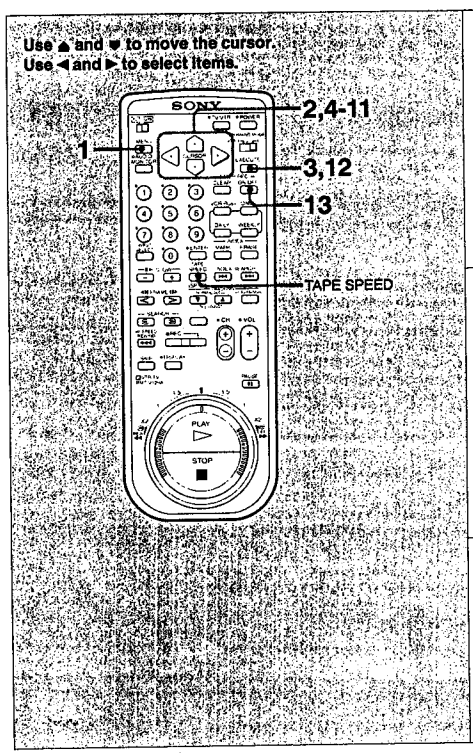
The timer recording function lets you preset your VCR to record up to eight programs within a one-month period. You'll do this procedure from the TIMER SET/CHECK display on your TV.

As a First Step
Before setting the timer, make sure that:

- The time and date clock is set correctly.
  If you intend to put the VCR into timer-activated recording mode without having preset the time and date, the VCR will enter clock setting mode automatically.
  (See "Setting the Time and Date" on page 19).
- The cassette is long enough to record all the programs.
- The safety tab on the cassette is intact. If you insert a cassette with no safety tab and press TIMER REC (ON/OFF), the cassette automatically ejects from the VCR.
- The VCR and TV are both turned on. (TV can be turned off after you've set up the VCR.)
- When you use a cable box, use Hook up 2 and set the CABLE BOX CONTROL (See "Setting the CABLE BOX CONTROL" on page 25.) Turn the cable box on.

Setting The Timer

EXAMPLE: Here's how to record a program broadcast on channel 26 from 9:00 pm to 10:55 pm on Saturday, July 10, 1993 in EP mode:



1 Press MENU.
The main MENU appears.

MENU
▶TIMER SET/CHECK
SET UP MENU
TUNER PRESET
SET VCR Plus+ CHANNELS
CABLE BOX CONTROL
CLOCK SET

2 Press ▲ or ▼ to move the cursor (▶) to TIMER SET/CHECK.

MENU
▶TIMER SET/CHECK
SET UP MENU
TUNER PRESET
SET VCR Plus+ CHANNELS
CABLE BOX CONTROL
CLOCK SET

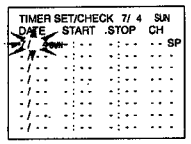
3 Press EXECUTE.
The TIMER SET/CHECK display appears on the screen. A short beep alerts you if the clock is not set properly. To reset the clock, refer to "Setting the Time and Date" (page 19).

TIMER SET/CHECK

DATE	START	STOP	CH
▶-/--	--:--	--:--	---
-/--	--:--	--:--	---
-/--	--:--	--:--	---
-/--	--:--	--:--	---
-/--	--:--	--:--	---
-/--	--:--	--:--	---
-/--	--:--	--:--	---

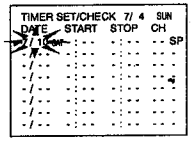
4 Press ▶.

Make sure that today's date is flashing. If it isn't, reset the clock to the correct time. See "Setting the Time and Date" (page 19).

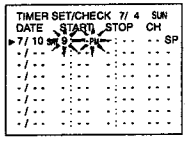


5 Press ▲ or ▼ to set the month and date to "7/10 SAT".

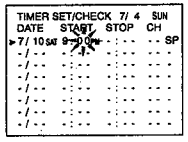
The day of the week is automatically set.



6 Press ▶ to flash the hours position under "START", then press ▲ or ▼ until "9:-- PM" appears.

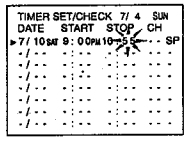


7 Press ▶ to flash the minutes position under "START", then press ▲ or ▼ until "00" appears.



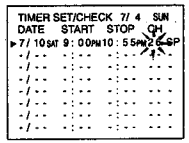
8 Press ▶.

The cursor blinks in the time field under "STOP". Set the time to finish recording, referring to steps 6 and 7.



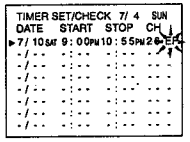
9 Press ▶ to flash the "CH" field, then press ▲ or ▼ until "26" appears.

Only the channels preset in the VCR will appear. You can also use the CHANNEL +/– or channel number buttons. When using a cable box, the cable box channels appear under "CH".



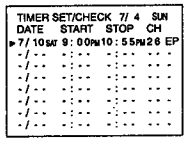
10 Press ▶ to flash the recording speed position, then ▲ or ▼ or TAPE SPEED until "EP" appears.

To change or correct a setting before entering it, press ◀ to return to the item you wish to change.



11 Press ▶ to store the setting.

When all of the settings stop flashing and a ▶ appears in the leftmost column, you've completed the setting. To preset another program, press ▲ or ▼ to move the cursor to the next line and repeat steps 4 to 11.



12 Press EXECUTE.

The message "Please push TIMER REC to set timer" appears on the TV screen.

13 Press TIMER REC (ON/OFF).

The VCR enters the timer recording standby mode and the TIMER REC (recording) indicator lights up on the VCR.
When using a cable box, make sure to leave it on. If a cassette is not loaded into the VCR, the TIMER REC (recording) indicator will not light up on the VCR window, but the timer program will be stored in the VCR.

To stop timer recording:

To stop timer recording while a program is being recorded, press TIMER REC(ON/OFF).

NOTES:

- To change or correct the setting before completing it, press ◀ to return to the item you wish to change.
- To record video sources from LINE IN 1, 2 or 3 jacks, press INPUT SELECT in any step from 4 to 11 to move the screen cursor to LINE 1, 2 or 3 in the "CH" position. This cursor returns to channel number on the fourth press.
- When CABLE BOX CONTROL is set to "ON", timer recording cannot be done through LINE IN.
- If you don't proceed for more than one minute, the VCR automatically exits from TIMER SET/CHECK menu.

Daily/Weekly Recording

You can preset your VCR for daily or weekly recording. Daily recording records the same program every day of the week while weekly recording records the same program on the same day, every week. Follow steps 1 to 4 in "Setting the Timer" (pages 37 and 38).
Each time you press ▼, the indicator under the "DATE" column changes to one of these choices:

CURRENT — date ←
↓
SUN — SAT (Every day of the week)
↓
MON — SAT(Every day except Sunday)
↓
MON — FRI (Every day except Saturday and Sunday)
↓
EVERY SAT
.
.
.
EVERY TUE
↓
EVERY MON
↓
EVERY SUN
↓
Date one month after from the current date

Timer Recording Standby Mode

When you return the VCR to the timer recording standby mode, you can record any previously preset programs. The VCR turns on automatically to record the first preset program. When it finishes recording, the power automatically shuts off.
To stop timer recording, press TIMER REC (ON/OFF).

Buttons Operable During Timer Recording

TIMER REC (ON/OFF)	To stop timer recording. (See page 38.)
COUNTER RESET	(See "Indexing Tape Contents," page 31.)
TV/VTR	(See "Watching One TV Program While Recording Another," page 36.)
DISPLAY	(See "The On-Screen Display," page 31.)
MENU	For checking the programs only. (See "Checking the Timer Settings," page 41.)

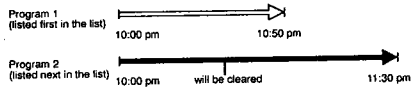
NOTE:

If a power interruption occurs during timer recording, recording will stop and your VCR will turn off. If power is restored within three hours and it's before the recording end time, recording will start again from that point. If the interruption lasts for more than three hours, any presettings will be erased and you'll need to reset the time and date for your programs. Note that the tape counter will return to "0H00M00S".

Overlapping Timer Recordings

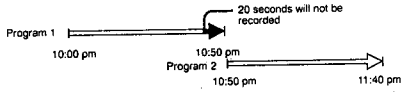
Case 1
If you preset two programs to start recording at the same time...

The program listed first on the TIMER SET/CHECK display has priority over the other programs. The timer settings for lower priority programs will be deleted from the TIMER SET/CHECK display when recording begins for the first program.



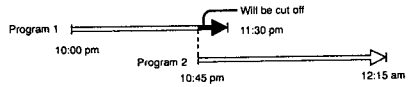
Case 2
If you preset program 2 to start recording at the same time you set program 1 to finish recording...

The last 20 seconds of program 1 will not be recorded.



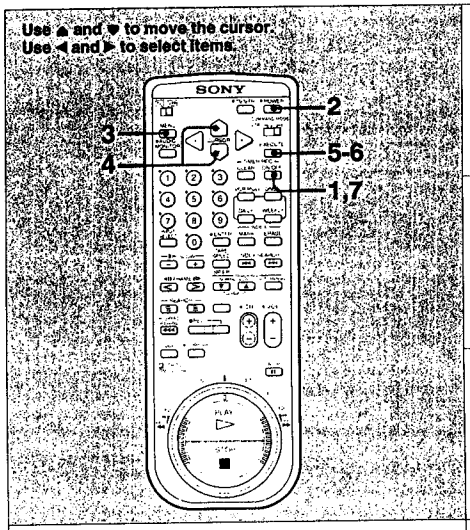
Case 3
If you preset program 2 to start recording before program 1 has finished recording...

Program 2 will begin recording before program 1 has finished.



Checking the Timer Settings

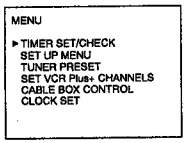
Here's how to display your timer settings to confirm the programs you wish to record.



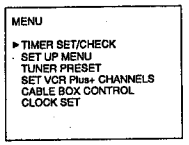
1 Press TIMER REC (ON/OFF).
The TIMER REC (recording) indicator turns off on the VCR.

2 Press POWER.

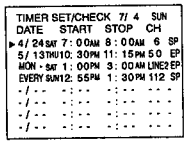
3 Press MENU.
The main MENU appears.



4 Press ▲ or ▼ to move the cursor (▶) to TIMER SET/CHECK.



5 Press EXECUTE.
The TIMER SET/CHECK display appears.


TIMER SET/CHECK 7/ 4 SUN
DATE START STOP CH
▶4/ 24SAT 7:00AM 8:00AM 6 SP
5/ 13THU10:30PM 11:15PM 50 EP
MON - SAT 1:00PM 3:00AM LINE2 EP
EVERY SUN12:55PM 1:30PM 112 SP

6 Press EXECUTE to return to the original screen.

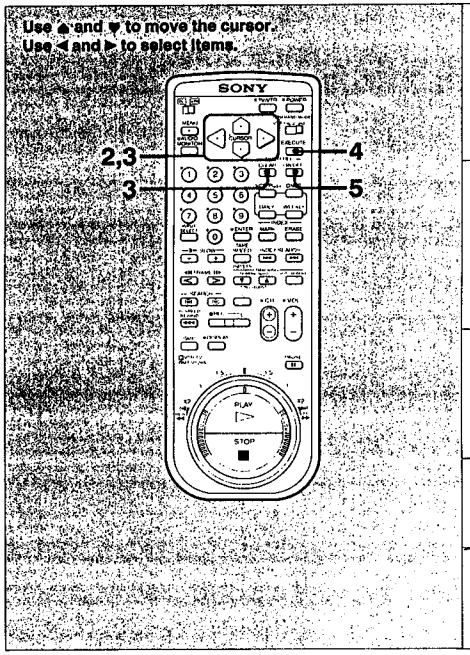
7 Press TIMER REC (ON/OFF).
The VCR returns to the timer recording standby mode. When using a cable box, make sure to leave it on.

NOTES:

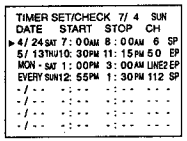
- If you set a program to record only one time, that setting is erased from the TIMER SET/CHECK display when the recording has finished.
- To check the timer settings during timer recording, follow steps 3 to 6 above.

Changing or Cancelling the Timer Settings

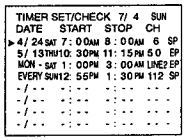
Here's how to change or cancel any timer settings from the TIMER SET/CHECK display:



1 Display the TIMER SET/CHECK menu on the TV screen by following the procedures outlined in "Checking the Timer Settings" on page 41.


TIMER SET/CHECK 7/ 4 SUN
DATE START STOP CH
▶4/ 24 SAT 7 : 00AM 8 : 00AM 6 SP
5/ 13THU10: 30PM 11: 15PM 5.0 EP
MON - SAT 1 : 00PM 3 : 00AM LINE2 EP
EVERY SUN12: 55PM 1 : 30PM 112 SP

2 Press ▲ or ▼ to move the cursor (▶) to the program you wish to change or cancel.


TIMER SET/CHECK 7/ 4 SUN
DATE START STOP CH
▶4/ 24 SAT 7 : 00AM 8 : 00AM 6 SP
5/ 13THU10: 30PM 11: 15PM 5.0 EP
MON - SAT 1 : 00PM 3 : 00AM LINE2 EP
EVERY SUN12: 55PM 1 : 30PM 112 SP

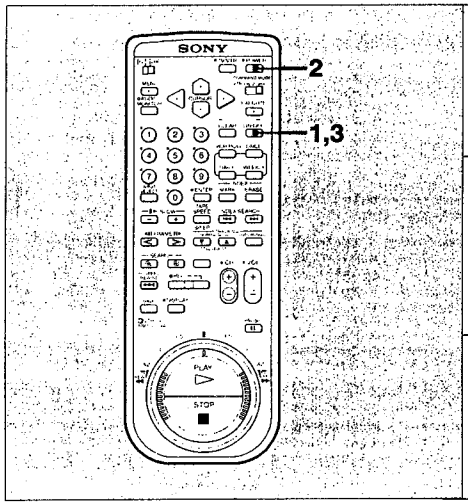
3 To change a program, select the item to be changed by pressing ◀ or ▶, then make changes pressing ▲ or ▼.
To cancel it, press TIMER CLEAR.
Repeat this step to change or cancel other settings.

4 Press EXECUTE.
This stores the changes and returns you to the original screen.

5 Press TIMER REC (ON/OFF).
This returns you to the timer recording standby mode. When using a cable box, make sure to leave it on.

Using the VCR Before Timer Recording Starts

If you want to use your VCR while it's in the timer recording standby mode, you must first turn off the TIMER REC (recording) indicator on the VCR. Here's how:



1 Press TIMER REC (ON/OFF).
The TIMER REC (recording) indicator on the VCR turns off and the VCR leaves the timer recording standby mode.

2 Press POWER.
The VCR is ready to use.

3 After using the VCR, press TIMER REC (ON/OFF).
The VCR returns to the timer recording standby mode and the TIMER REC (recording) indicator lights up. When using a cable box, make sure to leave it on.

Introducing VCR Plus+

VCR Plus + is a feature used in Sony VCRs that simplifies the task of programming your VCR to make unattended recordings. Here's how it works:

Whenever you want to record a TV program, all you need to do is to look up the program's "PlusCode", a number assigned to each program that's published in the TV section of most newspapers, cable TV listings, and even *TV Guide* magazine.

PlusCode

5:30 14 MOVIE—Musical (2hrs.) 33044
2 SPORTS—Golf (1hr. 25min.) 42060
CNN—WS 9974
6:30 2 3 4 DRAMA—Comedy (2hrs.) 17390
5 SCIENCE AND TECHNOLOGY
(1hr. 15min.) 73457

Then, just enter the number of the program you want — using the Remote Commander — and the VCR is automatically programmed to record that show. It's that simple. With VCR Plus+, you no longer have to go through a lengthy and often repetitive procedure when you set start and stop times, channel numbers, and dates. All this information is automatically sent to your VCR when you enter the program's PlusCode!

Of course, there's some setup you'll need to do before you use VCR Plus+ for the first time. But after this initial setup, just think of how much easier it'll be to record your favorite TV programs, cable movies, and sporting events — all with the touch of a few buttons. VCR Plus+ makes programming your VCR easier than ever!

NOTE:
If PlusCodes aren't yet available in your area, they'll probably be introduced soon. Check with your local newspaper for details.

VCR Plus+ Setup Instructions

Setting up your VCR to use VCR Plus+ involves coordinating the TV channel number (the number you turn to on your TV or VCR to watch a program) with the guide channel (the number that's assigned to that channel in your program guide).

If you don't have cable TV (i.e., if your TV receives its signal from an antenna only), the TV channel number and the guide channel number will probably be the same, in which case you'll only have to check that the two numbers match. For numbers that don't match, you must first perform the procedures that follow to get these channel numbers synchronized with each other.

To get the guide channel numbers, find the Channel Line-up Chart in the program guide for your area that features VCR PlusCodes. It usually looks like the example to the right.

If you have cable TV, you should then get the TV channel numbers for each channel from your cable company. (You may already know them.) Then **for channel numbers that are different**, enter the program guide channels (from the Program Guide), on the left, and the actual TV channels (from your cable system), on the right, as shown on page 45.

Example of "Channel Line-up Chart"

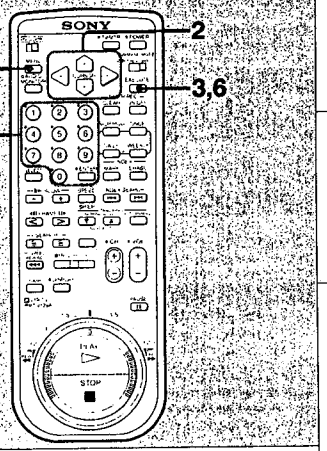
CABLE TV	Guide channel number
A&E Arts & Entertainment Network	39
AMC American Movie Classics	35
BRV Bravo (program grid only)	54
CNN Cable News Network	42
CSP C-SPAN	28
DIS The Disney Channel	53
DSC The Discovery Channel	37
ESN ESPN	34
FAM The Family Channel	47
HBO Home Box Office	33
LIF Lifetime	46
MAX Cinemax	45
MSG Madison Square Gardens Network	19
MTV Music Television	48
NIK Nickelodeon	38
SC Sports Channel	59
SCA Sports Channel America	70
SHO Showtime	41
TBS TBS SuperStation	43
TMC The Movie Channel	58
TNN The Nashville Network	49
TNT Turner Network Television	52
USA USA Network	44

For each channel your VCR receives, use the Channel line-Up Chart to check that the channel numbers match. For example, if HBO is listed in the Channel Line-Up Chart on channel 33, and your VCR receives HBO on channel 15, you need to coordinate these numbers using the following procedures. For channels in which the numbers are the same (for example, if your VCR receives HBO on channel 33, and the guide channel number is 33), you can skip these procedures.

Example:

Guide Channel (from "Channel Line-Up Chart" in your program guide)	TV Channel (channel you actually use on your VCR)
33 (Home Box Office)	15

Use ▲ and ▼ to move the cursor.
Use ◀ and ▶ to select items.



1 Press MENU.
The main MENU appears.

MENU
▶ TIMER SET/CHECK
SET UP MENU
TUNER PRESET
SET VCR Plus+ CHANNELS
CABLE BOX CONTROL
CLOCK SET

2 Press ▼ or ▲ to move the cursor (▶) to SET VCR Plus+ CHANNELS.

MENU
TIMER SET/CHECK
SET UP MENU
TUNER PRESET
▶ SET VCR Plus+ CHANNELS
CABLE BOX CONTROL
CLOCK SET

3 Press EXECUTE.
The SET VCR Plus+ CHANNELS menu appears.
The "GUIDE CH" field blinks.

SET VCR Plus+ CHANNELS
GUIDE CH TV CH
- -

4 In the "GUIDE CH" field, enter 33 (the number assigned to this channel in the Channel Line-Up Chart) and press ENTER.
The "TV CH" field blinks.

SET VCR Plus+ CHANNELS
GUIDE CH TV CH
33 - 33

5 In the "TV CH" field, enter 15 (the number to which you tune your VCR to watch this channel) and press ENTER.
To check your channel settings, press EXECUTE.

SET VCR Plus+ CHANNELS
GUIDE CH TV CH
33 - 15

NOTE:
The TV Channel setting will be different whether you use cable TV or not. Please refer to "Preparation" on page 6.

6 For each channel in which the TV channel differs from the guide number, repeat steps 4 and 5, using the menus that are displayed.

VCR Plus+ CHANNEL LIST
page 1

GUIDE	TV	GUIDE	TV
2	73	59	47
5	4	61	3
17	55	77	35
28	9	86	120
43	118	90	22

Use ◀ ▶ to change page
Push MENU to quit

7 When you've finished, press MENU to exit.

SAMPLE

Recording Programs Using VCR Plus+

To use VCR Plus + to record programs, all you need is the program's PlusCode, which you'll find in the program listings in your local newspaper, cable TV guide, or *TV Guide* magazine.
For example, to record the following program, just use the following procedures:

PlusCode

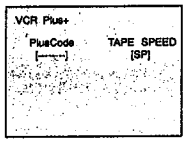
EXAMPLE: 13 **MOVIE**---Comedy (2hrs). 53292

NOTE:

- You can set the program without opening the VCR Plus+ menu. Refer to the display window on the VCR.
- When you use a cable box, use Hookup 2 and set the CABLE BOX CONTROL (See "Setting the CABLE BOX CONTROL" on page 25). Turn the cable box on.

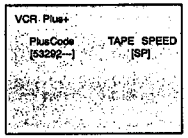
1 Press VCR Plus+.

The VCR Plus+ TIMER SET menu appears.



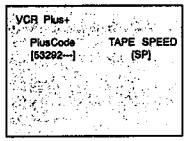
2 Enter 53292 (the program's PlusCode) in the PlusCode field.

If you make a mistake, press TIMER CLEAR and enter the PlusCode again.



3 To select the cassette's recording speed (SP or EP), press TAPE SPEED.

Unless you change the cassette speed, SP is used. See "Maximum recording time of a cassette" on page 29 for information about cassette speeds.

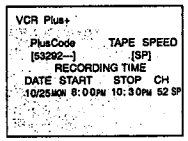


4 Press ONCE, DAILY, or WEEKLY on the Remote Commander.

See the following chart for details of these options.

ONCE:	Records scheduled programs one time only.
WEEKLY:	Records every week at the same scheduled time.
DAILY M-F:	Records Monday to Friday at the same scheduled time.

The VCR Plus + menu displays the recording information: date, program start and stop times, channel number, and tape speed.
If you make a mistake, press TIMER CLEAR, and start from the beginning.



5 If you want to set another program, repeat steps 1 to 4.

6 Insert a cassette into your VCR.

7 Press TIMER REC (ON/OFF) to set the VCR's recording timer.

The VCR enters the timer recording standby mode. Your VCR is now set up to record the programs you've selected. The VCR will turn on automatically, record the program, and then turn off until the next programmed show is ready for broadcast.

For checking, changing, cancelling the settings, see pages 41 and 42.

NOTES:

You can't set the timer using PlusCodes in the following cases:

- When the VCR is turned off
- When the VCR is in timer-recording or quick-timer recording mode.
- When the VCR is in the timer-recording standby mode

The timer will not accept settings in the following cases:

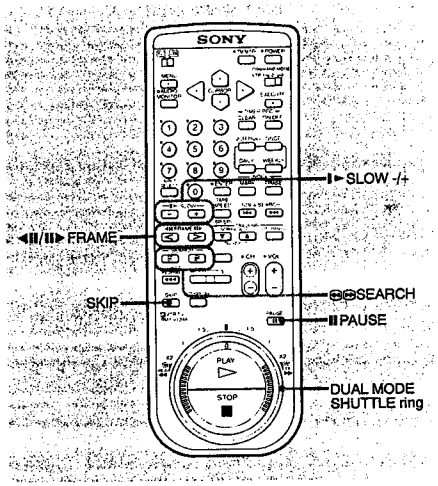
- When you select DAILY for a Saturday and Sunday program
- When you select WEEKLY or DAILY for a program more than the seven days ahead. (The WEEKLY and DAILY settings only work for the current week.)
- When you enter the PlusCode of a program that has already started or ended.

Variable Speed Playback

The following section explains the advanced playback functions you can use with your VCR.

Variable Speed Playback

Using the DUAL MODE SHUTTLE ring on your VCR or Remote Commander, you can play cassettes at a variety of forward and reverse speeds. You can also freeze a picture using the pause function.



Still Picture

When playing back a cassette, press II PAUSE to hold the picture in one place. To resume normal playback, press either ► PLAY or II PAUSE. If you leave your VCR in the pause mode, normal playback resumes after approximately 5 minutes.

Picture Search

By turning the DUAL MODE SHUTTLE ring either clockwise for forward viewing or counterclockwise for viewing in reverse, you can control the cassette playback speed.

- **Picture Search During Playback or Pause Modes**

While playing or pausing a cassette, turn the DUAL MODE SHUTTLE ring clockwise (forward direction) or counterclockwise (reverse direction) until the ▮ mark on the ring coincides with ◄◄ or ►►.
A high-speed picture without sound is displayed on the screen until you release the ring.

When you release the DUAL MODE SHUTTLE ring, it returns to its original position.
If you release the ring while in the pause mode, the picture returns to pause. If you release it during playback, the picture returns to playback.

NOTE
If you quick search a cassette recorded in the LP cassette speed, your picture may change to black and white, depending on the TV you're using.

- **Picture Search While Fast-Forwarding or Rewinding a Cassette**

When fast-forwarding or rewinding a cassette, you can turn and hold the DUAL MODE SHUTTLE ring to preview a high-speed picture (clockwise for forward viewing or counterclockwise for reverse viewing).

When you release the ring, it returns to its original position and the VCR continues fast-forwarding or rewinding.

Locked Picture Search

This feature lets you lock in and view a high-speed picture while playing or pausing a cassette. In the play or pause mode, press ◄◄ SEARCH (reverse) or ►► SEARCH (forward) on the Remote Commander.
To resume normal playback, press ► PLAY.

Skip Playback

While playing a cassette, press SKIP on the Remote Commander.
This feature lets you view your cassette at high speed for about 30 seconds of tape before resuming normal playback. If you press SKIP two times or more, the VCR skips one minute of a scene.

Slow Motion Playback

During playback or playback pause mode, press I► SLOW + or − on the Remote Commander. Change the slow motion speed with the + or − buttons.
Press + to increase the playback speed, and − to decrease the playback speed.
If you leave your VCR in slow motion playback for more than 5 minutes, normal playback resumes.

Frame-by-Frame Picture

During the playback pause mode, press FRAME II► > to advance the picture one frame or ◄II < FRAME to reverse the picture one frame.
Each time you press the button, the picture moves one frame. To resume normal playback, press ► PLAY.
FRAME II► > and ◄II < FRAME are also used to change the tape transporting direction during normal playback, double-speed playback and slow motion playback.

Picture Adjustment During Variable Speed Playback

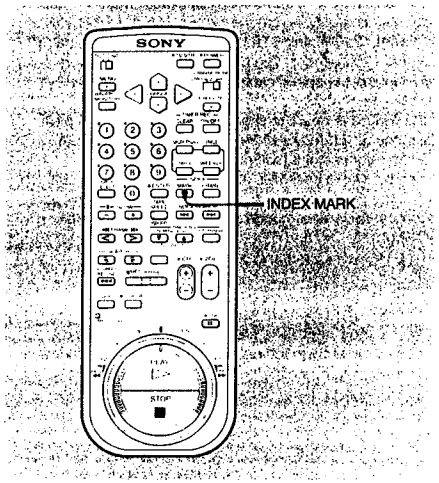
If a picture played in slow motion displays streaks or has poor sound quality, adjust the picture with the TRACKING NORMAL/SLOW and STILL ADJUST ▼/▲ buttons on the Remote Commander. You can adjust the picture more easily by changing the speed closer to normal playback by pressing I► SLOW +.
If the picture appears to shake in the still mode, adjust it using the STILL ADJUST ▼/▲ buttons on the Remote Commander until the picture stabilizes.
When pausing a cassette, you may notice a band at the top or bottom of the screen. Adjust the picture by playing back the cassette in slow motion and using the TRACKING NORMAL/SLOW and STILL ADJUST ▼/▲ buttons located on the Remote Commander.

NOTE:
Some snow or streaks are unavoidable when playing back a cassette in the reverse or reverse slow modes.

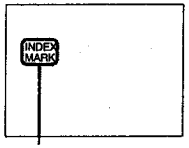
Index Function

You can find specific locations on a cassette using your VCR's index function.

Marking Index Signals



The VCR automatically inserts index signals each time you use the recording, timer recording or quick-timer recording functions (index mark). When an index mark is made, INDEX MARK appears on the TV screen. The index works as a divider between scenes, and is not numbers. So, when you specify the index mark later, you have to specify the relative position from the current position (the first index, the second index... from the current position). When going from the recording pause mode to the recording mode, an index is not inserted.



Appears while the index signal is being registered.

Automatic Index Mark

An index signal automatically marks the beginning of a program when you start recording it.

Manual Index Mark

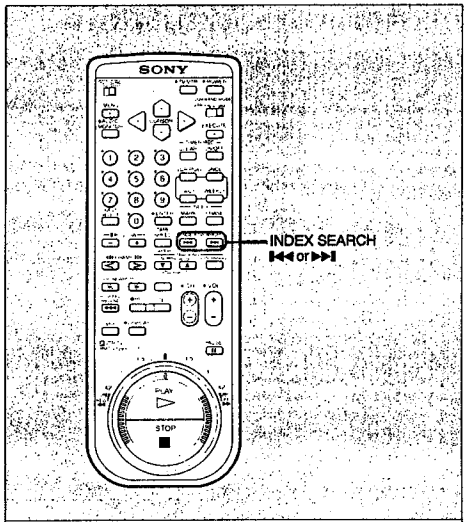
When recording or playing a cassette, you can manually mark an index signal by pressing INDEX MARK on the Remote Commander.

NOTES:

- When marking index signals, leave an interval of at least 3 minutes between them so that the VCR can detect the signals correctly.
- When you mark an index signal during playback, the recorded sound, though not erased, is inaudible.
- You cannot mark an index signal in the following cases:
  - On a cassette without a safety tab.
  - On an unrecorded portion of a cassette.
  - Immediately before a point on the cassette where the cassette speed (EP or SP) changes.
  - When playing a cassette recorded in LP mode.

Locating an Index – Index Search

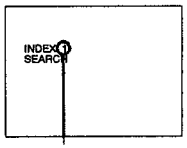
Locate an index by indicating how many index signals ahead or behind that program is from the cassette's current position. Here's how:



1 Insert an indexed cassette into your VCR.

2 Press INDEX SEARCH I◀◀ (reverse direction) or ▶▶I (forward direction) the necessary number of times to reach the desired index mark.

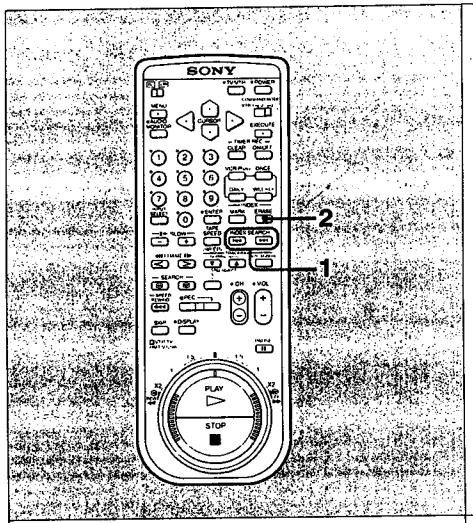
The VCR will rewind or fast-forward automatically and playback will start when the index number indicated on the TV screen reaches "0".
Up to 19 index signals from the present position on the tap can be located.



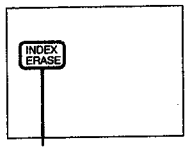
Indicates how many times you have pressed the button If you search for programs ahead of the current program the index number is shown with - (minus).

Erasing Index Signals

To remove any unwanted index signals, follow these steps:



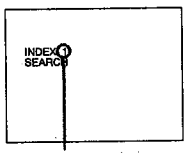
2 Press INDEX ERASE when the program of which you want to erase the index comes on the TV screen.



Appears while the index signal is being erased.

1 Press INDEX SEARCH I◀◀ (reverse direction) or ▶▶I (forward direction).

The VCR will rewind or fast-forward automatically and playback will start when the index number indicated on the TV screen reaches "0".



Indicates how many times you have pressed the button. If you search for programs ahead of the current program the index number is shown with - (minus).

To stop erasing index signals

Press ▶ PLAY or ■ STOP.

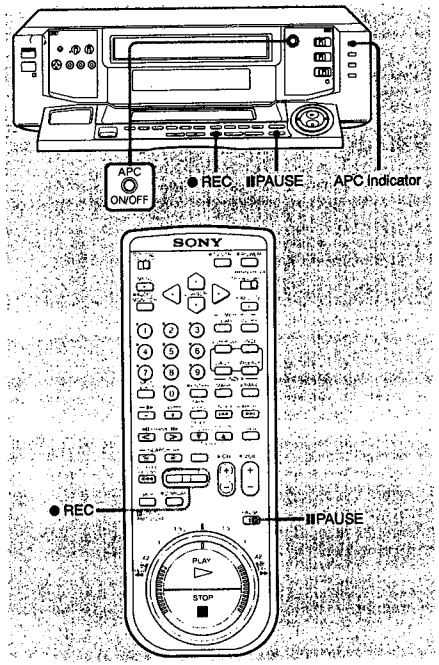
NOTES:

- While the index signal is being erased, the sound is inaudible.
- Index signals marked just before or after a change to the SP or EP recording mode cannot be erased.
- Index signals marked on a cassette recorded in LP mode cannot be erased.
- Index signals marked on the beginning of the tape cannot be erased.

APC (Adaptive Picture Control)

This function automatically improves recording and playback quality by adjusting the VCR for the condition of the video heads and video tape. To maintain better picture quality, we recommend that you leave the function on. (The APC indicator remains lit.)

Using the APC Function when Recording



Before you start recording, make sure the APC indicator is lit. If it is not, press the APC button inside the drop-down panel so that the APC indicator lights up.
The light flashes rapidly while the tape is being measured. The complete measurement is retained until the cassette is ejected. If you use that same tape again without ejecting it, the tape is not measured again.

When you are in the recording pause mode and the APC indicator flashes slowly

The APC function does not operate if you press II PAUSE to release the pause mode.
To use the APC function when the indicator flashes slowly, press ● REC. After measurement is completed, the VCR returns to the recording pause mode. Press II PAUSE to start recording.

When you are using timer recording

When you want to use the APC function during timer recording, press the APC button on so that the APC indicator lights up, then press the TIMER REC button.

Using the APC Function when Playing Back a Tape

When the APC indicator is on, the APC function automatically works on all types of tapes, including rental tapes. You can play back a tape using the APC function even if the tape was not recorded with it.

NOTES:

- Tapes recorded using the APC function are played back normally on VCRs that do not have the APC function.
- If the EDIT button inside the drop-down panel is set to "ON" during playback, the APC function does not operate.
- When doing audio/video insert editing, turn off the APC function as the timing of the insert may be incorrect when the function is on.

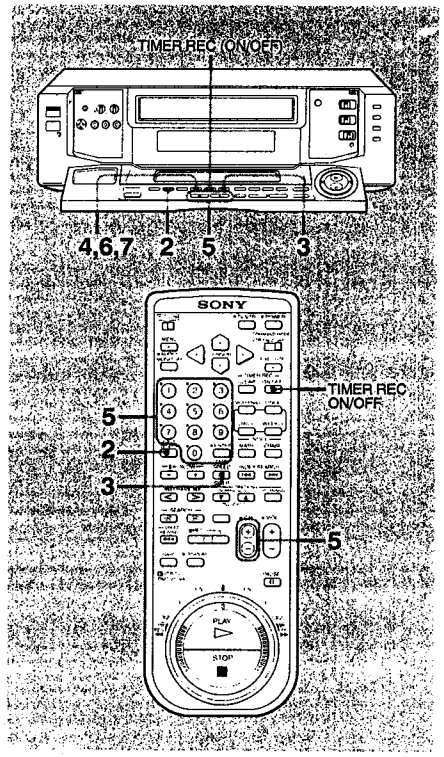
Quick-Timer Recording

This function provides you a shortcut to recording programs without going through the entire timer setting procedure. You can preset the timer up to 9 hours in units of 30 minutes.

NOTE:

- Before you begin, make sure the clock has been set, then ensure that the timer recording function is turned off by checking the TIMER REC (recording) indicator. If the indicator is lit, press TIMER REC ON/OFF to turn it off.
- When you use a Cable Box, use Hookup 2 and set the CABLE BOX CONTROL (See "Setting the Cable Box Control" on page 25). Turn the cable box on.

Quick-Timer Recording



If your VCR is in stop mode, perform all of the following steps. If your VCR is currently recording, skip steps 1 to 6, and begin with step 7.

1 **Insert a cassette into your VCR.**

2 **Press INPUT SELECT so that the TUNER indicator will appear in the display window.**

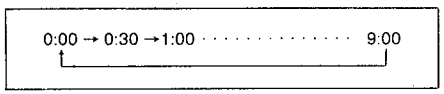
3 **Select the desired recording speed (SP or EP) by pressing TAPE SPEED.**

4 **Press QUICK TIMER.**
If you insert a cassette without its safety tab, your VCR will eject the cassette.

5 **Select the channel you wish to record using the CHANNEL +/– on the VCR, or CH +/– or channel number buttons on the Remote Commander. Press ENTER while the channel display flashes.**

6 **Press QUICK TIMER again to start recording.**

7 **Select the recording duration by pressing QUICK TIMER to change the duration indicator in the display window. Each time you press QUICK TIMER, the recording duration increases by 30 minutes.**
Once recording has finished, your VCR will turn off automatically.



To stop quick-timer recording

To stop quick-timer recording while a program is being recorded, press TIMER REC ON/OFF.

NOTES:

- If your cassette ends during quick-timer recording, recording stops and the VCR turns off. The cassette will not rewind automatically.
- If a power interruption occurs during quick-timer recording, recording will stop and your VCR will turn off. If the interruption lasts less than three hours and the power is restored before the recording end time, recording will start again from that point.

Buttons Operable During Quick-Timer Recording

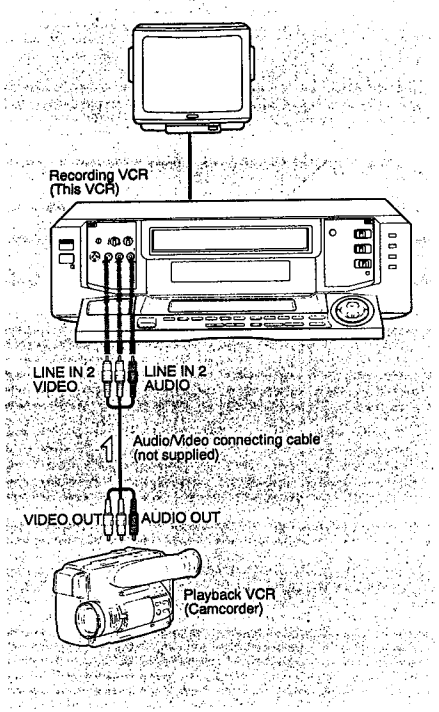
TIMER REC (ON/OFF)	To stop quick-timer recording
QUICK-TIMER	To change recording duration
COUNTER RESET	To reset the counter to zero
TV/VTR	To watch the picture broadcast on another channel (TV)
MENU	Only operable to check the timer recording settings. (See "Checking the Timer Settings," on page 41.)

Editing

Using an additional VCR, you can record programs from one VCR to the other. Here's how:

Editing from Another VCR

Here's how to edit from another VCR (such as an 8mm camcorder for playback) when using this VCR for recording.



Before you start:

- Select LINE 1, 2 or 3 with INPUT SELECT, whichever the playback VCR is connected to.
- Select LINE IN 1 VIDEO "STD" or LINE IN 3 VIDEO "STD" in the SET UP MENU depending on your connection method when you connect this VCR and other VCR.
- Select SP or EP with TAPE SPEED.
- Press EDIT to light the EDIT indicator in the display window.

NOTE:
If your playback VCR has an editing function, this function should also be selected to avoid deterioration of picture quality.

How to edit:

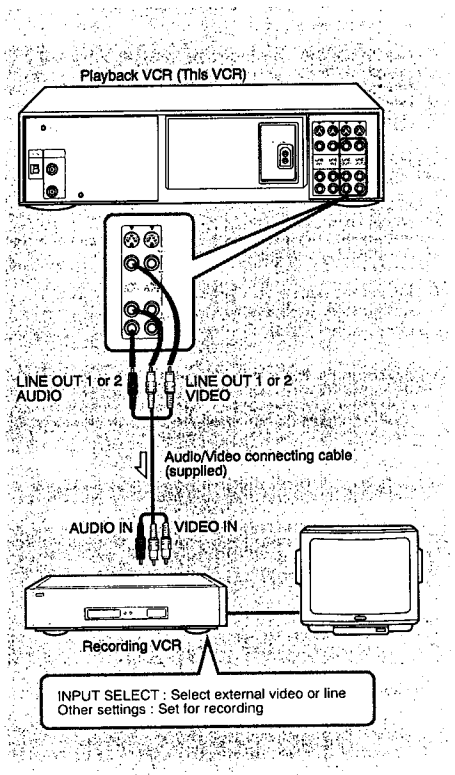
1 **Insert a blank cassette into the recording VCR with a safety tab in place.**
2 **Turn on the playback VCR and insert a source cassette.**
3 **Locate the playback start point and select the playback pause mode on the playback VCR.**
4 **Locate the recording start point and select the recording pause mode on the recording VCR.**
5 **Press ❚❚ PAUSE on both VCRs.**
For best results, press ❚❚ PAUSE on the playback VCR just before pressing ❚❚ PAUSE on the recording VCR. When you've finished editing, press ■ STOP on both VCRs.
When you release the recording pause mode, the APC function may not operate.
For details, see page 53.

NOTES:

- If your playback VCR is a stereo unit, make connections with the supplied audio/video connecting cable.
- If your playback VCR is a monaural unit, connect the white plug to LINE IN 2 AUDIO L on this VCR. This lets you record the sound of the playback VCR on both channels of this VCR. Do not connect the white plug to LINE IN 2 AUDIO R.
- When connecting the VCRs, do not connect both LINE IN and LINE OUT jacks on your VCRs simultaneously. Doing so may cause a humming noise.
- Tapes recorded using the APC function are played back normally on VCRs that do not have the APC function.
- If you have set the EDIT button to ON, the APC function does not operate when playing back a tape but does operate when recording.
When you are editing tapes (dubbing) using this unit as either the recording VCR or the playback VCR, use the EDIT setting.
- When the other VCR has an S VIDEO connector, use the S VIDEO connecting cable. This connection gives you a higher quality picture than using the video cable. When using LINE IN 1 S VIDEO or LINE IN 3 S VIDEO, select LINE IN 1 VIDEO "S" or LINE IN 3 VIDEO "S" in the SET UP MENU depending on your connection method.
- If you use the VIDEO IN jack and S VIDEO IN connector at the same time when you use LINE IN 2, the S VIDEO IN connector takes priority.

Editing onto Another VCR

Here's how to use this VCR as the playback VCR and another VCR as the recording VCR.



Before you start:

- **Press EDIT to light the EDIT indicator in the display window.**
If your recording VCR has an editing function, it should also be selected to improve reception.
- Select AUTO DISPLAY OFF in the SET UP MENU screen and press DISPLAY several times until the on-screen display disappear from the TV screen.

How to edit:

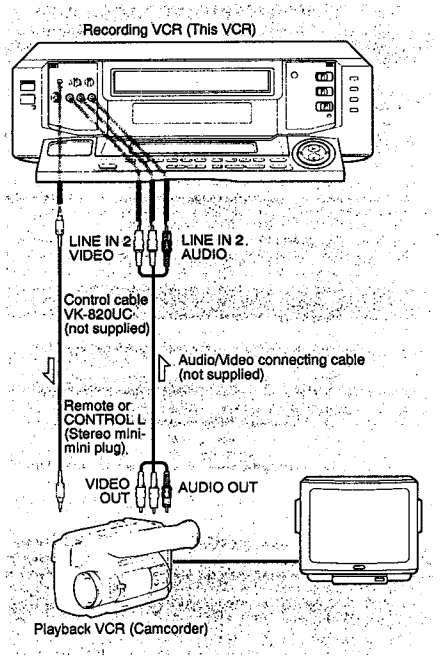
1 **Turn on the recording VCR and insert a blank cassette with a safety tab in place.**
2 **Insert a source cassette into the playback VCR.**
3 **Locate the playback start point and select the playback pause mode on the playback VCR.**
4 **Locate the recording start point and select the recording pause mode on the recording VCR.**
5 **Press ❚❚ PAUSE on both VCRs.**
For best results, press ❚❚ PAUSE on the playback VCR just before pressing ❚❚ PAUSE on the recording VCR. When you've finished editing, press ■ STOP on both VCRs.

NOTES:

- If your recording VCR is a stereo unit, make connections with the supplied audio/video connecting cable.
- If your recording VCR is a monaural unit, make connections using the VMC-910HG/920HG cable (not supplied).
- When connecting the VCRs, do not connect both LINE IN and LINE OUT jacks on your VCRs simultaneously. Doing so may cause a humming noise.
- If the EDIT button inside the drop-down panel is set to "ON" during playback, the APC function does not operate.
- If your recording VCR is equipped with the S VIDEO INPUT connector, you can use the supplied S VIDEO connecting cable to connect to the S VIDEO OUT connector on the VCR.

Synchronized Editing

If your other VCR has a CONTROL L or S connector, you can take advantage of a feature called "Synchronized Editing". Synchro-Edit controls both VCRs (recording VCR and playback VCR), and releases the pause when SYNCHRO EDIT is pressed. To use this function, you must connect the control cable in addition to connecting the audio and video cables. There are two types of control cables; the CONTROL L (REMOTE) cable and the CONTROL S cable. Use the one corresponding to the type of connector on the VCR.
If you want to make the CONTROL L connection, you must choose the LANC MODE in the SET UP MENU screen. (For details, see page 28.) If you want to control another VCR from this VCR, set the LANC MODE to "M" for this VCR and "S" for another VCR.
If you want to make the CONTROL S connection, you must connect the CONTROL S IN of this VCR to the CONTROL S OUT of other VCR. (For details, see page 59.)



Before you start:
- Select external video or LINE on the recording VCR.
- Make necessary settings for recording.

How to edit:

1 Turn on the recording VCR and insert a blank cassette.

2 Insert a source cassette into the playback VCR.

3 Select EDIT position to light the EDIT indicator in the display window.
If your recording VCR has an editing function, it should also be selected.

4 Locate the edit start point and select the recording pause mode on the recording VCR.

5 Locate the playback start point and select the playback pause mode on the playback VCR.

6 Press SYNCHRO EDIT on the recording VCR.
Both recording and playback will start.

7 At the desired edit end point, press SYNCHRO EDIT on the recording VCR.
The recording VCR enters the recording pause mode and the playback VCR enters the playback pause mode.

8 To edit the next scene, repeat steps 5, 6 and 7.
When you've finished editing, press ■ STOP on both VCRs.

About the (LANC)
LANC stands for Local Application Control System. The LANC connector is used for controlling the tape transport of video equipment and peripherals connected to it. This connector has the same function as the connectors indicated as CONTROL L or REMOTE.

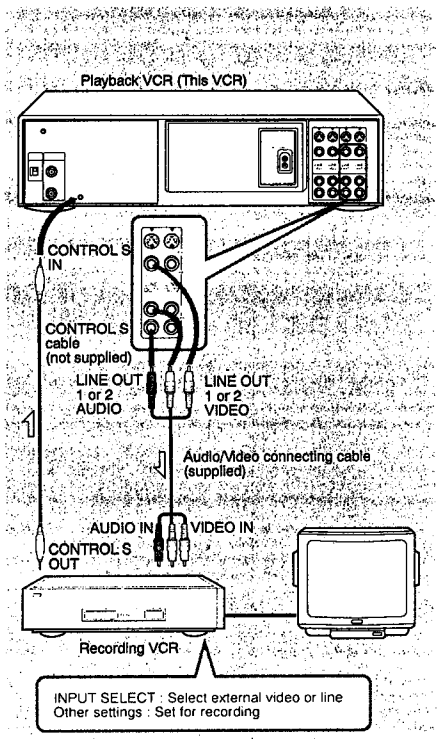
NOTES:
- If your recording VCR is a monaural unit, make connections using the VMC-910HG/920HG cable (not supplied).
- When connecting the VCRs, do not connect both LINE IN and LINE OUT jacks on your VCRs simultaneously. Doing so may cause a humming noise.
- When the other VCR has an S VIDEO connector, use the S VIDEO connecting cable. This connection gives you a higher quality picture than using the video cable.
  When using LINE IN 1 S VIDEO or LINE IN 3 S VIDEO, select LINE IN 1 VIDEO "S" or LINE IN 3 VIDEO "S" in the SET UP MENU depending on your connection method.
  If you use the VIDEO IN jack and S VIDEO IN connector at the same time when you use LINE IN 2, the S VIDEO IN connector takes priority.
- You cannot set the LANC MODE to "M" for the camcorder. Set the LANC MODE to "M" for this VCR and control the camcorder from this VCR.
- If you set the LANC MODE to the same setting position for both this VCR and another VCR, it is possible that there may be a malfunction. Do not use the same LANC MODE setting for both VCRs.

(Continued)

NOTES:
- If the other VCR has the LANC connector and the CONTROL S OUT connector, use the LANC connector. Do not make the LANC and CONTROL S connections simultaneously.
- If other VCR has the REMOTE jack without LANC or , it is possible that you may not control other VCR from this VCR.
- You cannot perform synchronized editing on the CCD-V8, V8AFU and EV-C8.
- If the tape recording condition of other VCR (playback VCR) is bad, the output picture of this VCR (recording VCR) may become a blue screen on the TV screen for a moment. It is not an indication of malfunction. Recording will be made safe.
- When you record a stereo/bilingual tape source from other VCR, set the audio output of other VCR so that the main and sub sounds are output at the same time.
- When connecting with camcorder such as the CCD-TR900, CCD-TR1000 and CCD-TR1, you can take advantage of more precise synchronized editing.

When Using the CONTROL S Cable

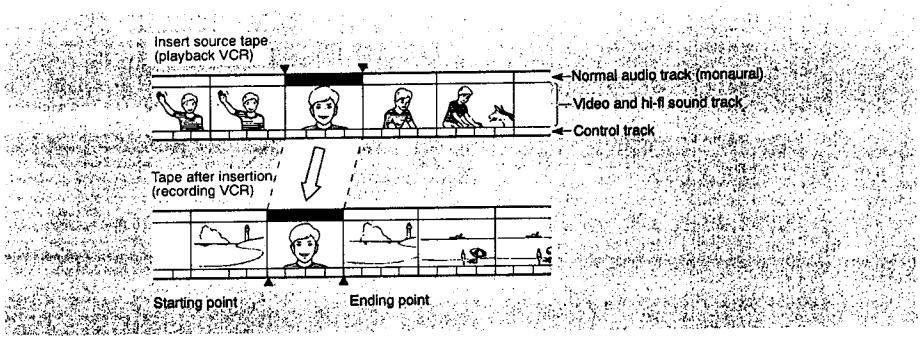
Set the command mode of this VCR and the other video equipment to the same position. If the other video equipment has a synchronized edit function, use SYNCHRO EDIT on the other equipment.



Insert Editing

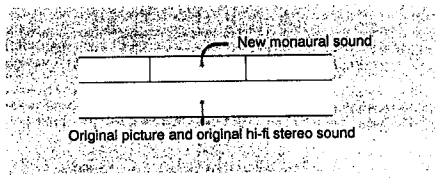
When you want to replace one prerecorded scene (and its sound) with another, you can use your SLV-R1000's insert editing function. This function lets you make either video inserts, audio inserts, or both video and audio inserts.

How the Insert Editing Function Works



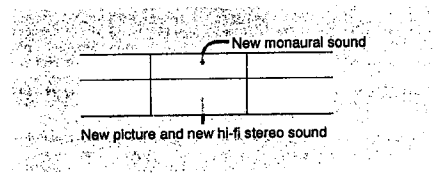
Audio Insert

You can insert a monaural sound track onto a prerecorded cassette. The picture and hi-fi stereo sound of the video and hi-fi audio track are retained.



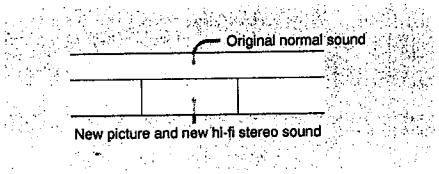
Video and Audio Insert

You can insert a new picture, hi-fi stereo sound, and a new monaural sound onto a prerecorded cassette.



Video Insert

You can insert a new picture and hi-fi stereo sound from a video and hi-fi audio track onto a prerecorded cassette. Note that the original audio track is retained.

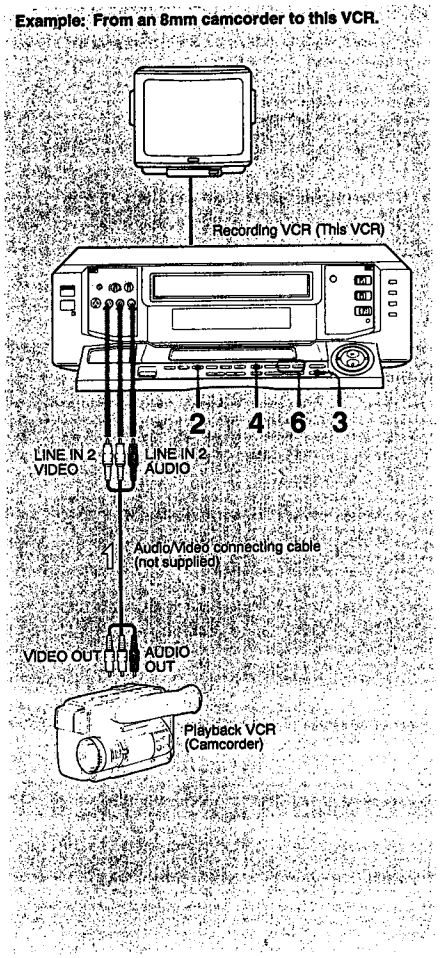


Insert Indicators and On-screen Display

Insert	Indicator	On-screen Display
Audio	A INSERT lights up	A INS
Video	V INSERT lights up	V INS
Audio/ video	AV INSERT lights up	AV INS

Insert Editing from another VCR

Example: From an 8mm camcorder to this VCR.



Before you start:

- For connection, see pages 57 through 58. (The CONTROL L connections are not needed.)
- Select the insert source from the equipment connected to LINE IN 1, 2 or 3.
- Connect the VCR to an audio system for "audio insert."

How to edit:

1 **Insert a source cassette into the playback VCR and a cassette for recording into this VCR.**

2 **Press EDIT to light the EDIT indicator in the display window.**
If your playback VCR has an editing function, it should also be selected.

3 **On the recording VCR locate the edit end point, then press ❚❚ PAUSE on this VCR.**

4 **Press COUNTER RESET on the recording VCR.**

5 **On the recording VCR, rewind the cassette to locate the starting point and set the VCR to the playback pause mode.**
The DUAL MODE SHUTTLE ring is useful for locating a desired starting point.

6 **Press VIDEO/AUDIO INSERT.**
For audio insert, press AUDIO. The "A INSERT" lights up in the display window.
For video insert, press VIDEO. The "V INSERT" lights up in the display window.
For audio and video insert, press the AUDIO and then VIDEO. The "AV INSERT" lights up in the display window.

7 **On the playback VCR, locate the starting point where you want to start the insertion and set the VCR to the playback pause mode.**

8 **Press ❚❚ PAUSE on both VCRs to start the insertion.**
At the ending point (0H00M00S), the insertion stops automatically. (To stop playback, press ■ STOP.)

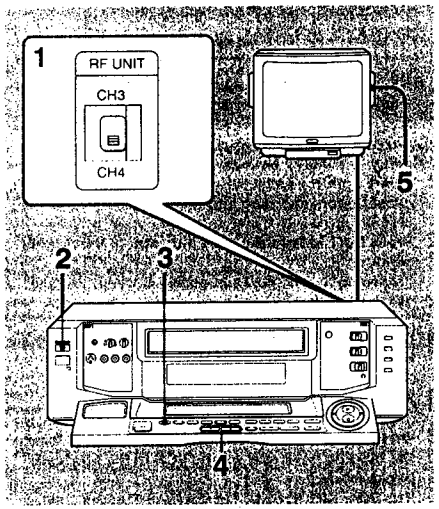
To stop the insertion temporarily:
Press ❚❚ PAUSE.
To stop ongoing insertion:
Press ■ STOP.

NOTES:

- The video/audio inserts cannot be made onto an unrecorded portion of a cassette.
- After the insertion, the previous picture and/or sound will be erased.

General Setup Information

Setting the RF Unit



Why this setting is necessary:

You must set the RF UNIT selector at the rear of the VCR properly so that your TV can receive the correct signal from the VCR. Set the selector to CH3 (channel 3) or CH4 (channel 4), whichever is not active in your area.

If you connect a TV, or color monitor equipped with A/V input jacks, skip this setting.

1 **Set the RF UNIT at the rear of the VCR to CH3 or CH4, whichever is not active in your area.**

2 **Press POWER.**
The power indicator lights up on the VCR.

3 **Press TV/VTR so that the VTR indicator lights up in the display window.**

4 **Check that the TUNER indicator appears in the display window, then select an active channel in your area by pressing CHANNEL +/−.**

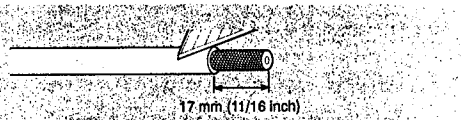
5 **Turn on your TV and set it to the channel you selected in step 1.**

Your TV is now tuned to the VCR. Whenever you use the VCR, set the TV to the preselected channel.

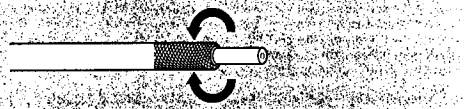
NOTE:
For details on adjusting TV channels, see your TV instruction manual.

Attaching the F-Type Connector (not supplied)

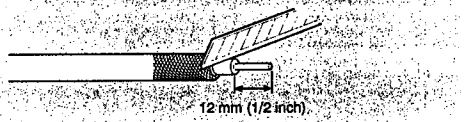
1 **Strip 17mm (11/16") of the black polyvinyl jacket.**



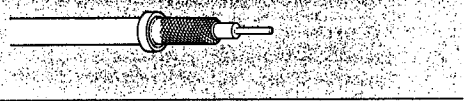
2 **Fold back the woven wire.**



3 **Strip 12 mm (1/2") of the white plastic casing, leaving 12 mm of the center conductor.**

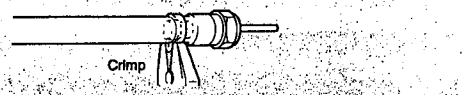


4 **Slip the crimping ring over the cable.**

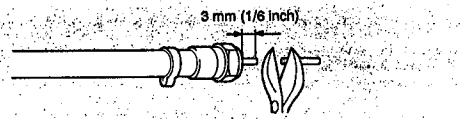


5 **Insert the liner conductor into the F-type connector shaft and push the end of the cable into the connector as far as it will go.**

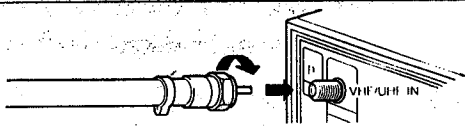
6 **Slide the crimping ring over this assembly. Pinch the crimping ring with pliers to hold the connection in place.**



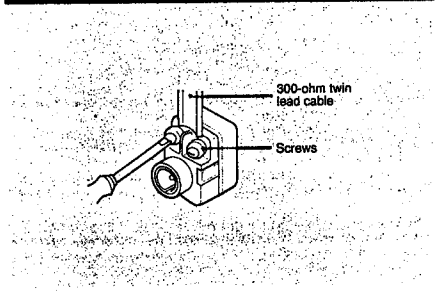
7 **Cut the center conductor leaving 3mm (1/16") from the end.**



8 **Insert the F-type connector into VHF/UHF IN plug on the VCR.**



Attaching the External Antenna Connector (supplied)

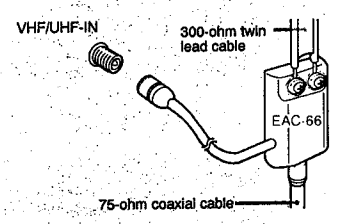


1 Loosen the screws on the antenna connector.

2 Fit the 300-ohm twin lead cable on the UHF antenna under the screws on the antenna connector.

3 Retighten the screws.

Attaching the EAC-66 U/V Band Separator/Mixer (not supplied)



1 Loosen the screws on the U/V band separator/mixer.

2 Fit the 300-ohm twin lead cable on the UHF antenna under the screws.

3 Retighten the screws.

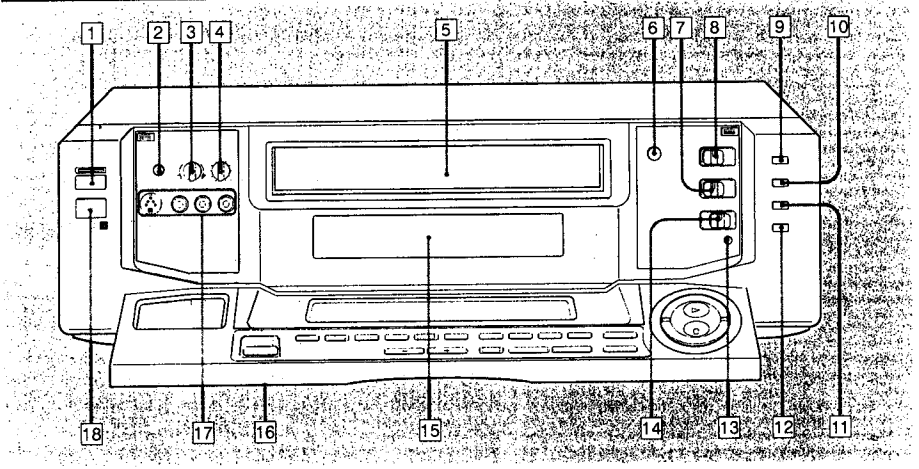
4 Connect the 75-ohm coaxial cable to the U/V band separator/mixer.

5 Connect the U/V band separator/mixer to the VHF/UHF IN plug on the VCR.

Identifying the Parts and Controls

Refer to the pages indicated for details.

Front Panel



[1] **POWER ON/OFF switch and indicator (see page 62.)**

[2] **CONTROL L jack (stereo mini-mini jack) (see page 58.)**

[3] **SHARPNESS SOFT/SHARP control (see page 32.)**

[4] **REC LEVEL control (see page 34.)**

[5] **Cassette compartment (see page 29.)**

[6] **APC ON/OFF button (see page 53.)**

[7] **BACKLIGHT switch**
This switch controls the brightness of the backlight in three stages (OFF, DIM, BRT).

[8] **S-VHS ON/OFF switch (see page 4.)**

[9] **APC indicator (see page 53.)**

[10] **SYNCHRO EDIT indicator (see page 58.)**

[11] **REC indicator (see page 34.)**

[12] **TIMER REC indicator (see page 38.)**

[13] **CL (clear) button (see page 71.)**

[14] **COMMAND MODE VTR 1/2/3 (OFF, 1, 2, 3) switch (see page 16.)**

[15] **Display window (see page 68.)**

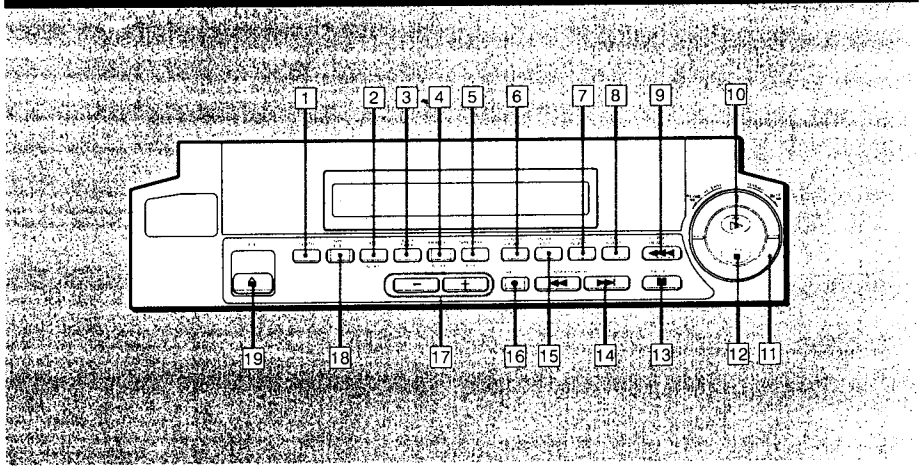
[16] **Drop-down panel (see page 66.)**

[17] **LINE IN 2 S VIDEO connector, VIDEO and AUDIO (phono type) jacks (see pages 56 and 58.)**

[18] **Remote sensor (see page 16.)**

Refer to the pages indicated for details.

Inside of Front Panel



1 TV/VTR button (see pages 21 and 36.)

2 EDIT (ON/OFF) button (see pages 57, 58 and 61.)

3 QUICK TIMER button (see page 54.)

4 TIMER REC (ON/OFF) button (see pages 38 to 43.)

5 TAPE SPEED (SP/EP) button (see pages 34.)

6 COUNTER RESET button (see page 31.)

7 AUDIO INSERT button (see page 61.)

8 VIDEO INSERT button (see page 61.)

9 ◀◀◀ HI-SPEED REWIND button (see page 30.)

10 ▶ PLAY button (see page 30.)

11 DUAL MODE SHUTTLE ring (see page 48.)

12 ■ STOP button (see pages 30 and 34.)

13 ❚❚ PAUSE button (see pages 30, 34 and 48.)

14 ⏮ ⏭ INDEX SEARCH buttons (see pages 51 and 52.)

15 SYNCHRO EDIT button (see page 58.)

16 ● REC button (see page 34.)

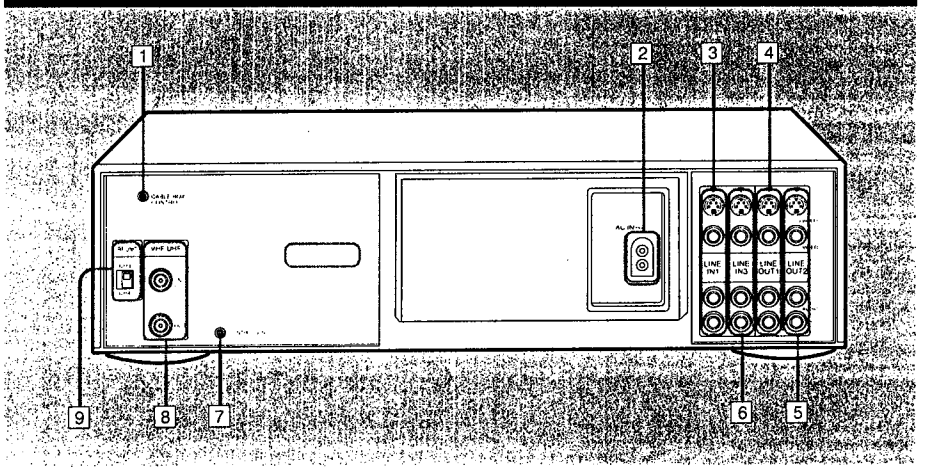
17 CHANNEL +/– buttons (page 34.)

18 INPUT SELECT button (see pages 38 and 56.)

19 ⏏ EJECT button (see page 29.)

Refer to the pages indicated for details.

Rear Panel



1 CABLE BOX CONTROL jack (see page 8.)

2 AC IN socket (see page 6.)

3 LINE IN 1 S VIDEO connector, VIDEO and AUDIO (phono type) jacks (see page 57.)

4 LINE OUT 1 S VIDEO connector, VIDEO and AUDIO (phono type) jacks (see page 57.)

5 LINE OUT 2 S VIDEO connector, VIDEO and AUDIO (phono type) jacks (see pages 57 and 59.)

6 LINE IN 3 S VIDEO connector VIDEO and AUDIO (phono type) jacks (see pages 56 and 61.)

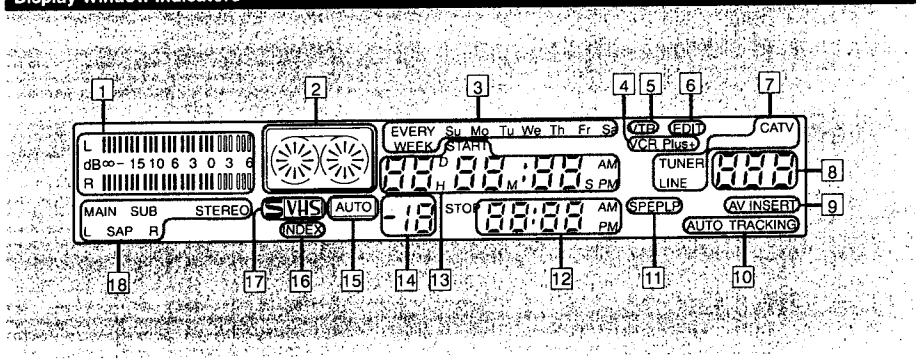
7 CONTROL S IN jack (see page 59.)

8 VHF/UHF IN/OUT connectors (F-type) (see pages 8, 10, 12 and 14.)

9 RF UNIT selector (see page 62.)

Refer to the pages indicated for details.

Display Window Indicators



[1] **Peak level meter**

[2] **Cassette indicator**

Operation mode	Type of cassette mark	Mark's rotating speed
When a cassette is inserted		does not rotate
Normal playback		rotates slowly.
Rewind		rotates fast counterclockwise.
Fast-forward		rotates fast clockwise.
Picture search (forward)		rotates fast clockwise.
Picture search (reverse)		rotates fast counterclockwise.
Stop		does not rotate.
Record		rotates slowly.
Pause		stops rotating.
Frame-by-frame		rotates at intervals
Slow motion		rotates slowly.

[3] **Day of the week indicator, EVERY WEEK indicator for timer-activated recording (see page 39.)**

[4] **VCR Plus + indicator (see page 46.)**

[5] **VTR indicator (see pages 21, 36 and 62.)**

[6] **EDIT indicator (see pages 57, 58 and 61.)**

[7] **Input mode indicator (see pages 34 and 56.)**

[8] **Channel number/Input mode indicator**

[9] **AV INSERT indicator (see page 61.)**

[10] **AUTO TRACKING indicator (see page 32.)**

[11] **Tape speed indicator (see page 34.)**

[12] **Quick-timer recording time/current time/recording stop time (see pages 20, 39 and 54.)**

[13] **Linear time counter/recording start time (see pages 31 and 39.)**

[14] **Index/program number (see pages 34 and 50 to 52.)**

[15] **AUTO play indicator (see page 30.)**

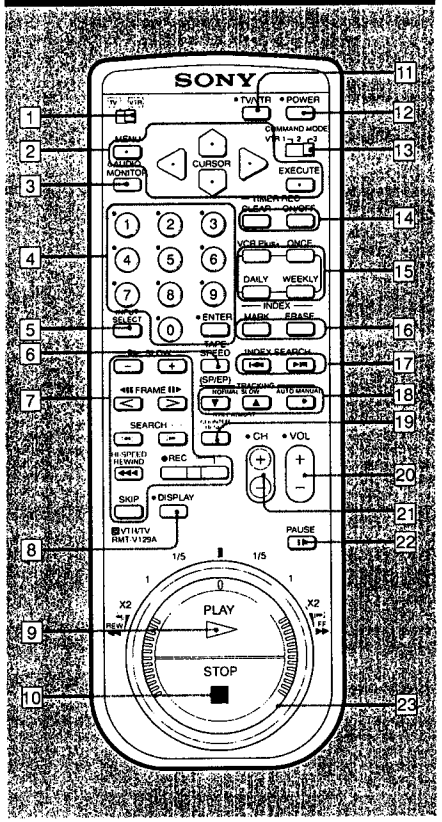
[16] **INDEX indicator (see pages 50 to 52.)**

[17] **S-VHS indicator (see page 4.)**

[18] **Stereo program/SAP indicator (see page 36.)**

Refer to the pages indicated for details.

Remote Commander



[1] **TV/VTR remote control selector (see page 16.)**

[2] **Menu operations buttons (see pages 19 and 20.)**
MENU button
Cursor buttons (▲/▼/◀/▶)
EXECUTE button

[3] **AUDIO MONITOR button (see page 32.)**

[4] **Channel number buttons and ENTER button (see page 34.)**

[5] **INPUT SELECT button (see pages 38 and 56.)**

[6] **TAPE SPEED (SP/EP) button (see pages 34 and 38.)**

[7] **Tape transport buttons**
I▶ SLOW –/+ buttons (see page 49.)
</> ◀II FRAME II▶ buttons (see page 49.)
◀◀ / ▶▶ SEARCH buttons (see page 49.)
◀◀◀ HI-SPEED REWIND button (see page 30.)
● REC button (see page 34.)
SKIP button (see page 49.)

[8] **DISPLAY button (see page 31.)**

[9] **▶ PLAY button (see page 30.)**

[10] **■ STOP button (see pages 30 and 34.)**

[11] **TV/VTR button (see pages 21 and 36.)**

[12] **POWER button (see page 62.)**

[13] **COMMAND MODE VTR 1/2/3 selector (see page 16.)**

[14] **TIMER REC buttons (see page 42.)**
CLEAR button
ON/OFF button

[15] **VCR Plus + buttons (see page 46.)**

[16] **INDEX buttons (see pages 50 to 52.)**
MARK button
ERASE button

[17] **I◀◀ ▶▶I INDEX SEARCH buttons (see pages 51 and 52.)**

[18] **TRACKING buttons (see pages 32 and 49.)**
▼/▲ NORMAL/SLOW (STILL ADJUST) buttons
AUTO/MANUAL button

[19] **COUNTER RESET button (see page 31.)**

[20] **VOL (volume) +/– buttons**

[21] **CH (channel) +/– buttons**

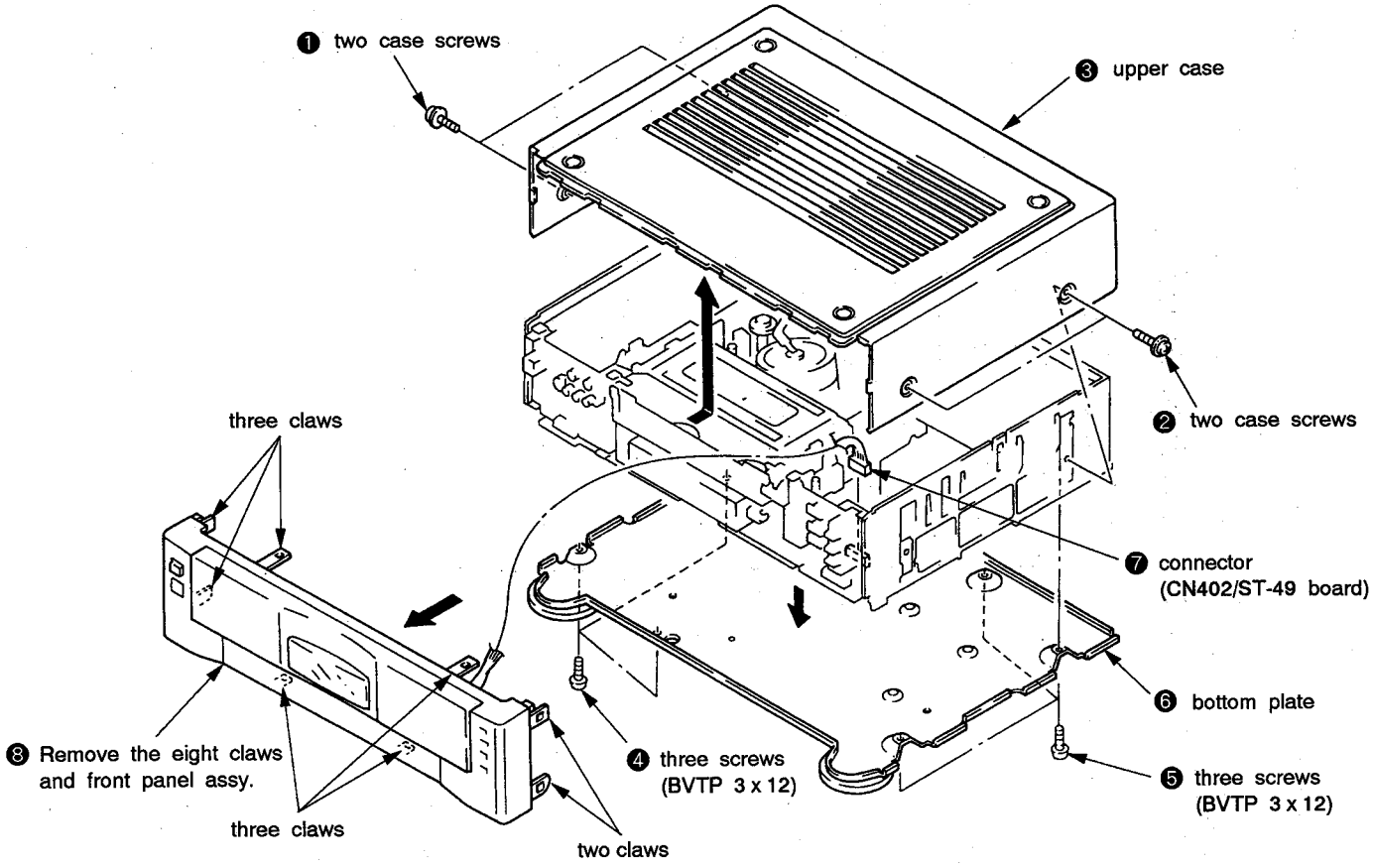
[22] **II PAUSE button (see pages 30, 34 and 48.)**

[23] **DUAL MODE SHUTTLE ring (see page 48.)**

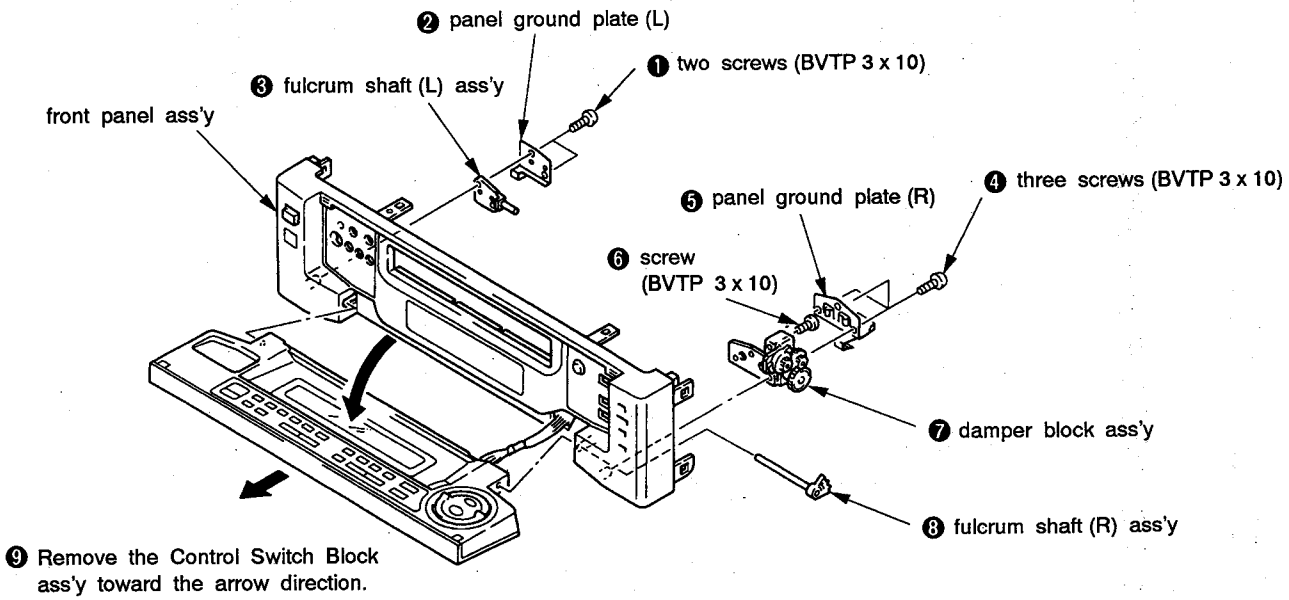
SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

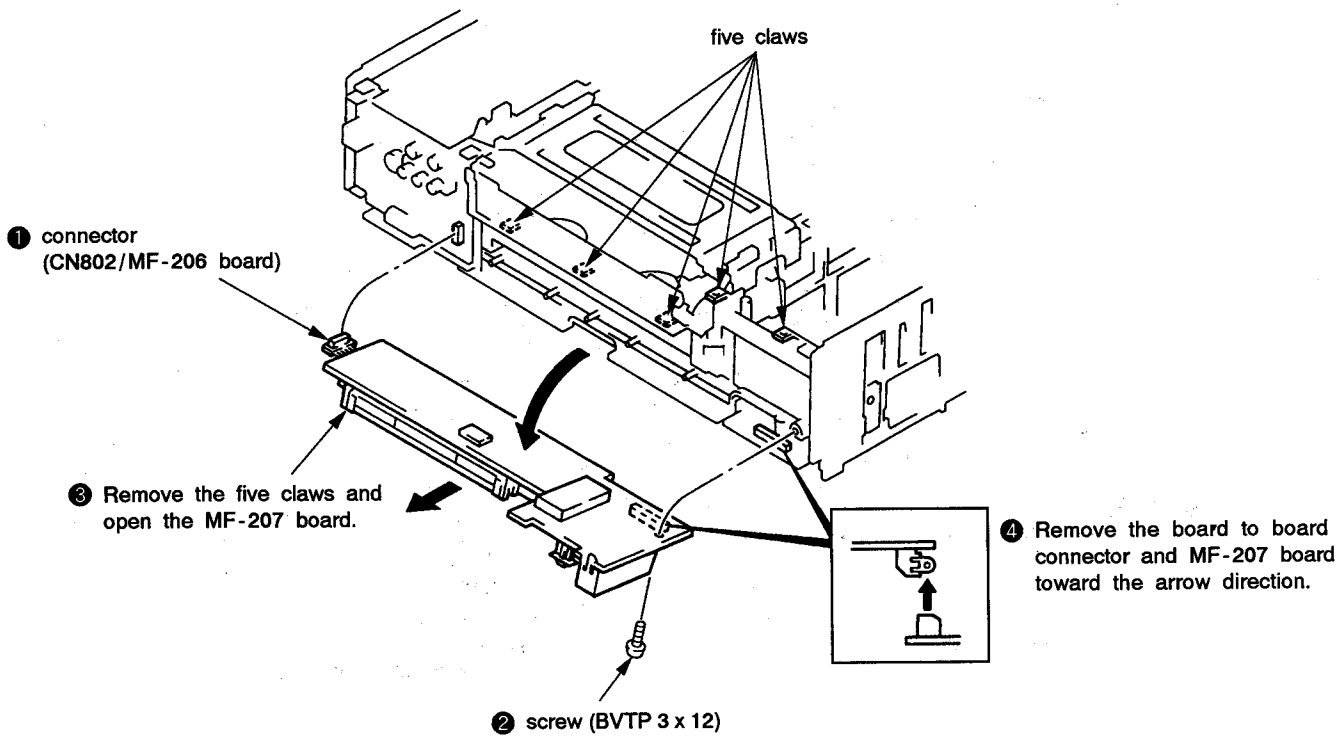
2-1. REMOVAL OF UPPER CASE, BOTTOM PLATE AND FRONT PANEL ASSEMBLIES


❶ two case screws
❸ upper case
❷ two case screws
three claws
❼ connector (CN402/ST-49 board)
❻ bottom plate
❽ Remove the eight claws and front panel assy.
❹ three screws (BVTP 3 x 12)
❺ three screws (BVTP 3 x 12)
three claws
two claws

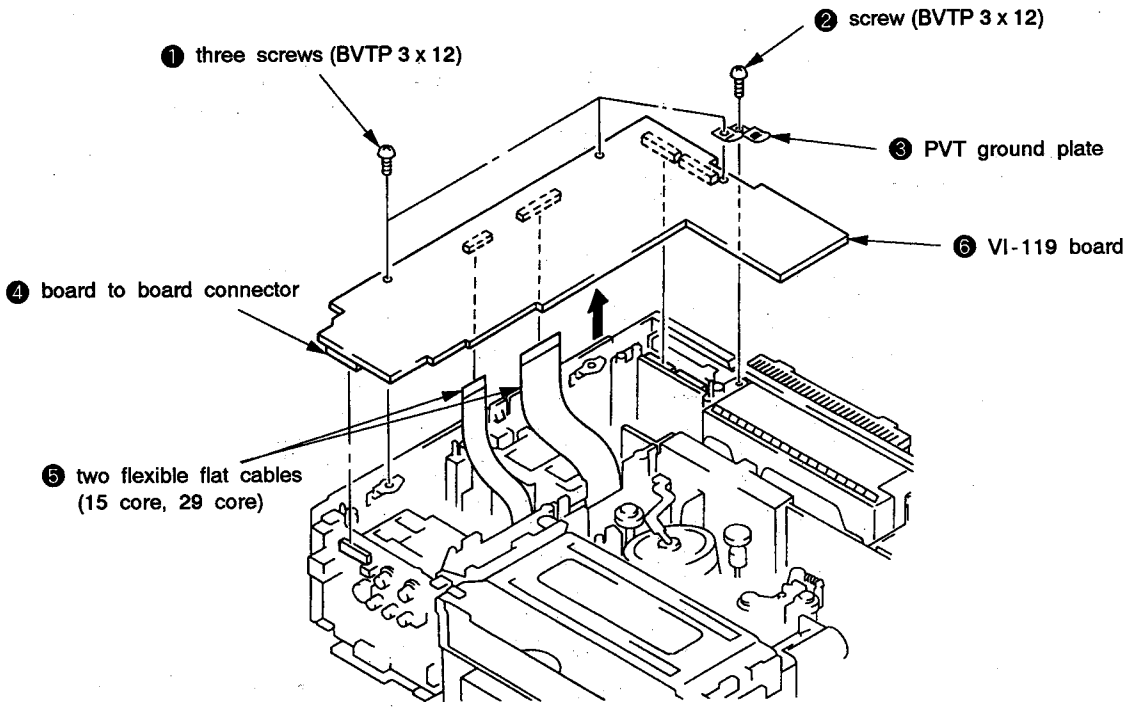
2-2. REMOVAL OF CONTROL SWITCH BLOCK ASSEMBLY


❷ panel ground plate (L)
❶ two screws (BVTP 3 x 10)
❸ fulcrum shaft (L) ass'y
front panel ass'y
❺ panel ground plate (R)
❹ three screws (BVTP 3 x 10)
❻ screw (BVTP 3 x 10)
❼ damper block ass'y
❽ fulcrum shaft (R) ass'y
❾ Remove the Control Switch Block ass'y toward the arrow direction.

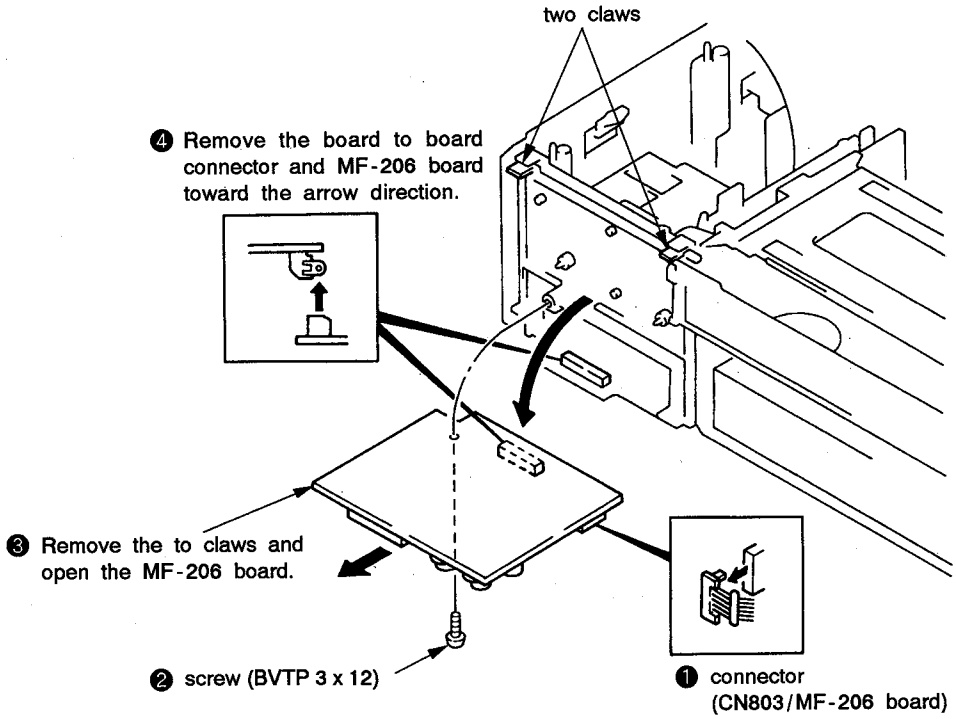
2-3. REMOVAL OF MF-207 BOARD


five claws
❶ connector
(CN802/MF-206 board)
❸ Remove the five claws and
open the MF-207 board.
❹ Remove the board to board
connector and MF-207 board
toward the arrow direction.
❷ screw (BVTP 3 x 12)

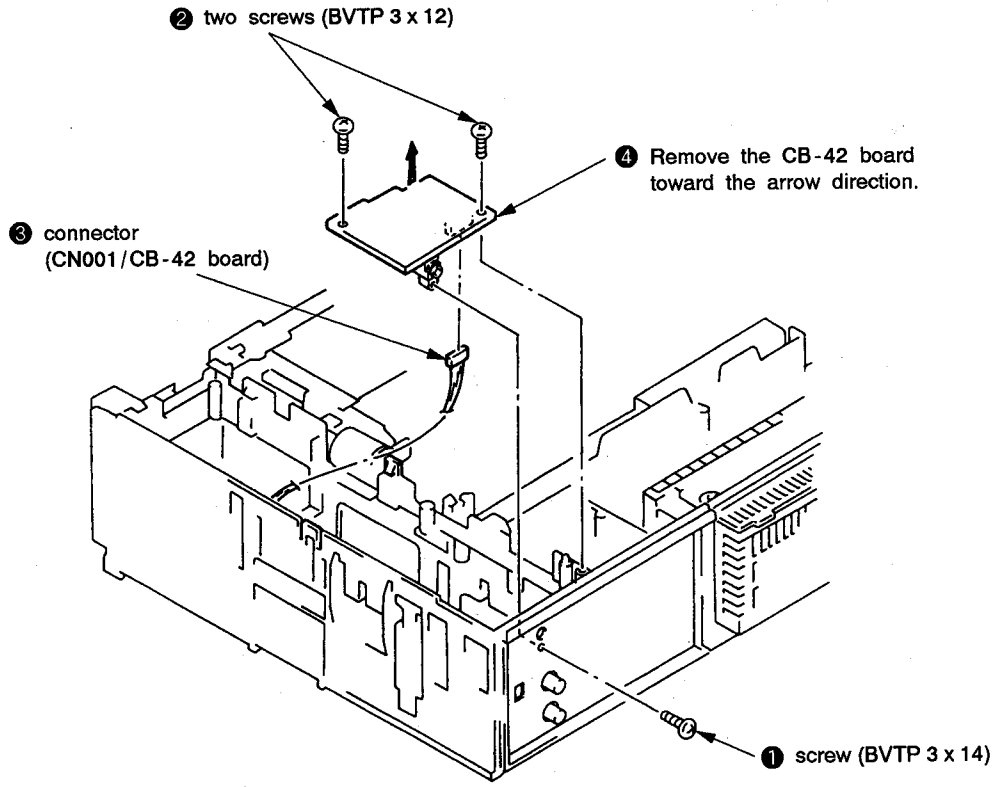
2-4. REMOVAL OF VI-119 BOARD


❷ screw (BVTP 3 x 12)
❶ three screws (BVTP 3 x 12)
❸ PVT ground plate
❻ VI-119 board
❹ board to board connector
❺ two flexible flat cables
(15 core, 29 core)

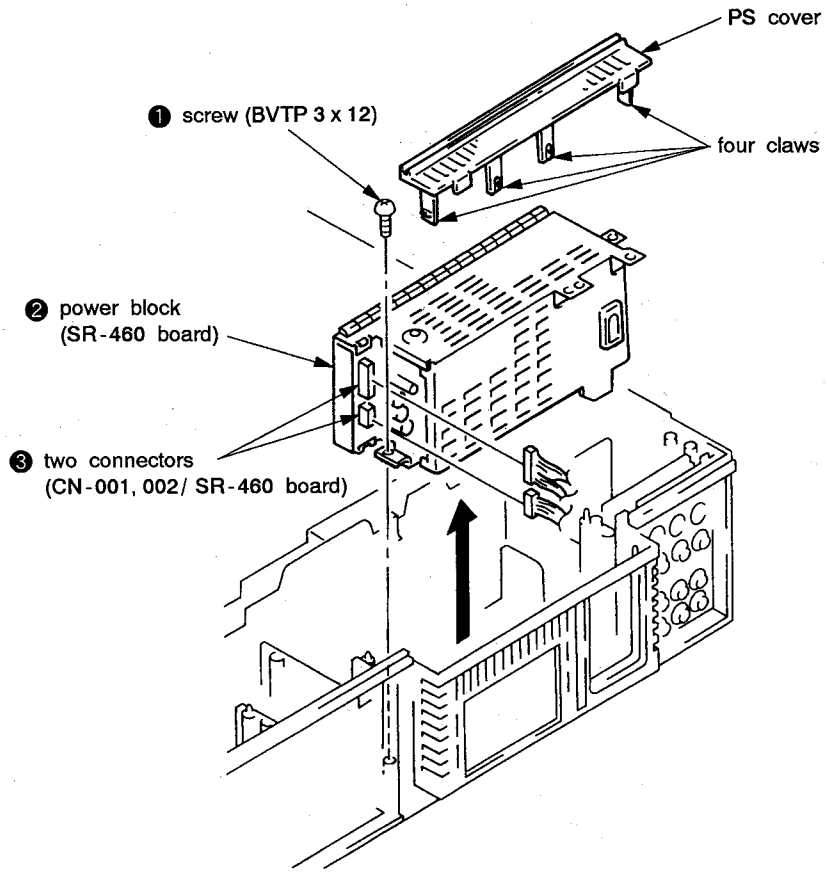
2-5. REMOVAL OF MF-206 BOARD


two claws
❹ Remove the board to board connector and MF-206 board toward the arrow direction.
❸ Remove the to claws and open the MF-206 board.
❷ screw (BVTP 3 x 12)
❶ connector (CN803/MF-206 board)

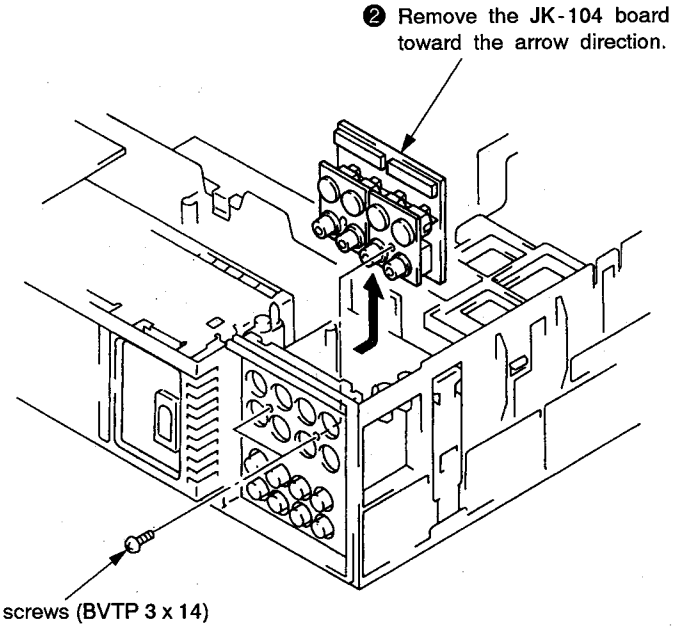
2-6. REMOVAL OF CB-42 BOARD



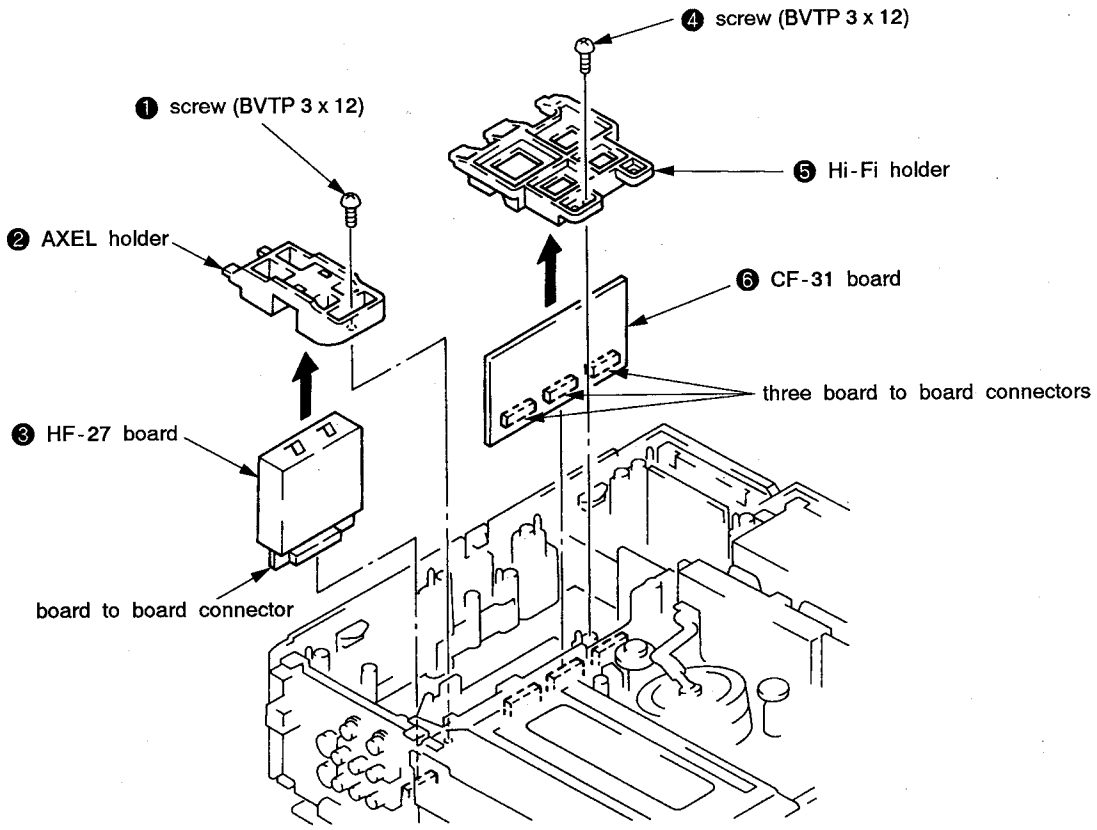
2-7. REMOVAL OF POWER BLOCK (SR-460 BOARD)



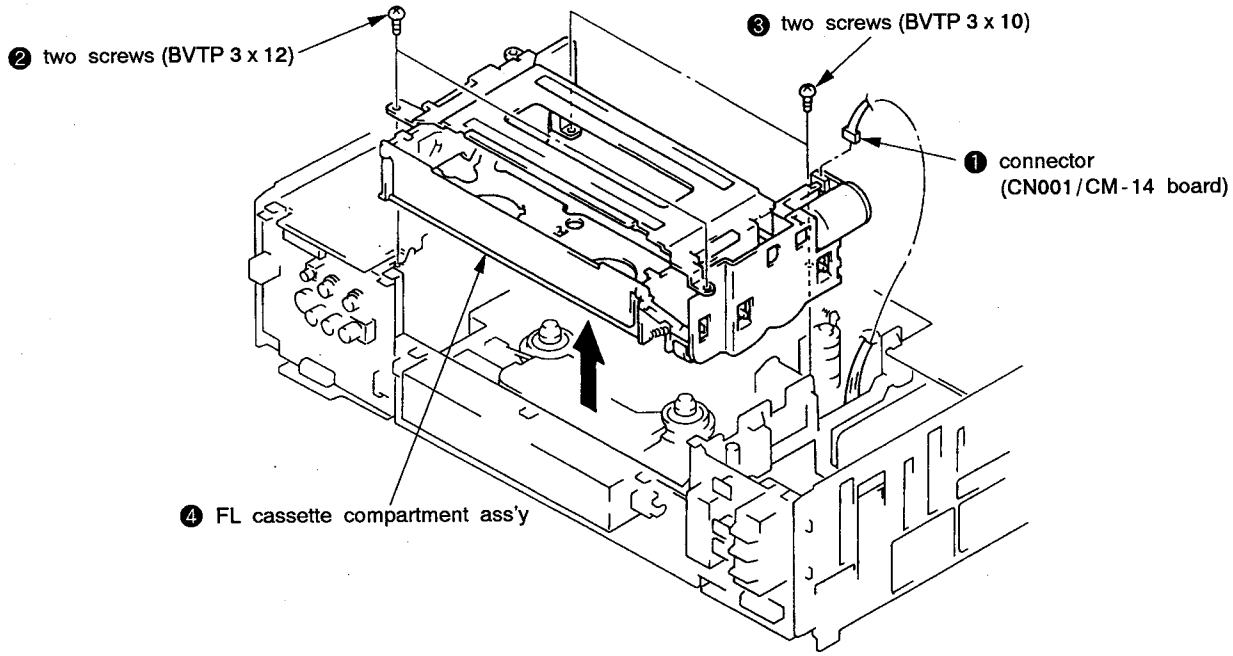
2-8. REMOVAL OF JK-104 BOARD



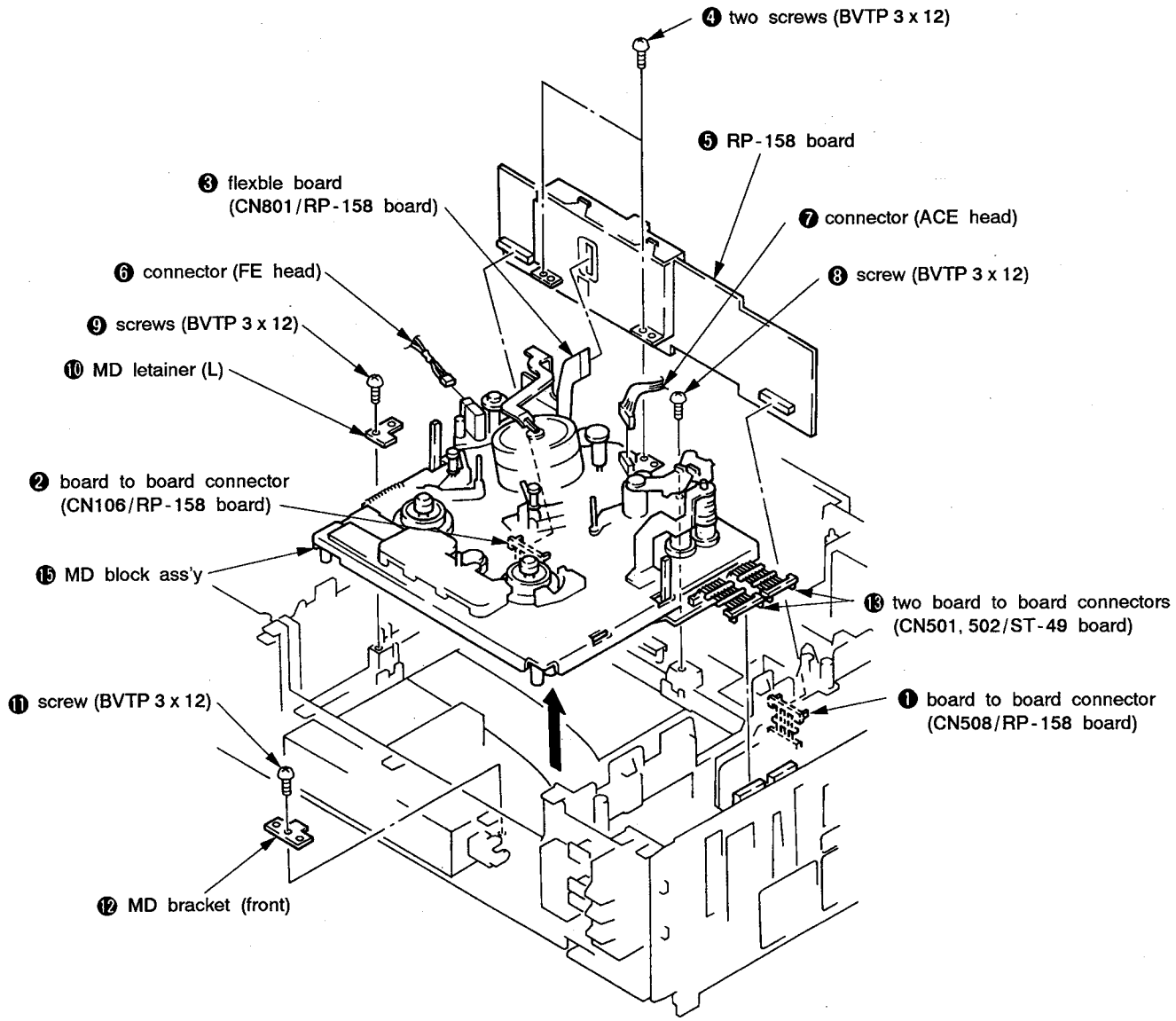
2-9. REMOVAL OF HF-27 BOARD AND CF-31 BOARD


❹ screw (BVTP 3 x 12)
❶ screw (BVTP 3 x 12)
❺ Hi-Fi holder
❷ AXEL holder
❻ CF-31 board
three board to board connectors
❸ HF-27 board
board to board connector

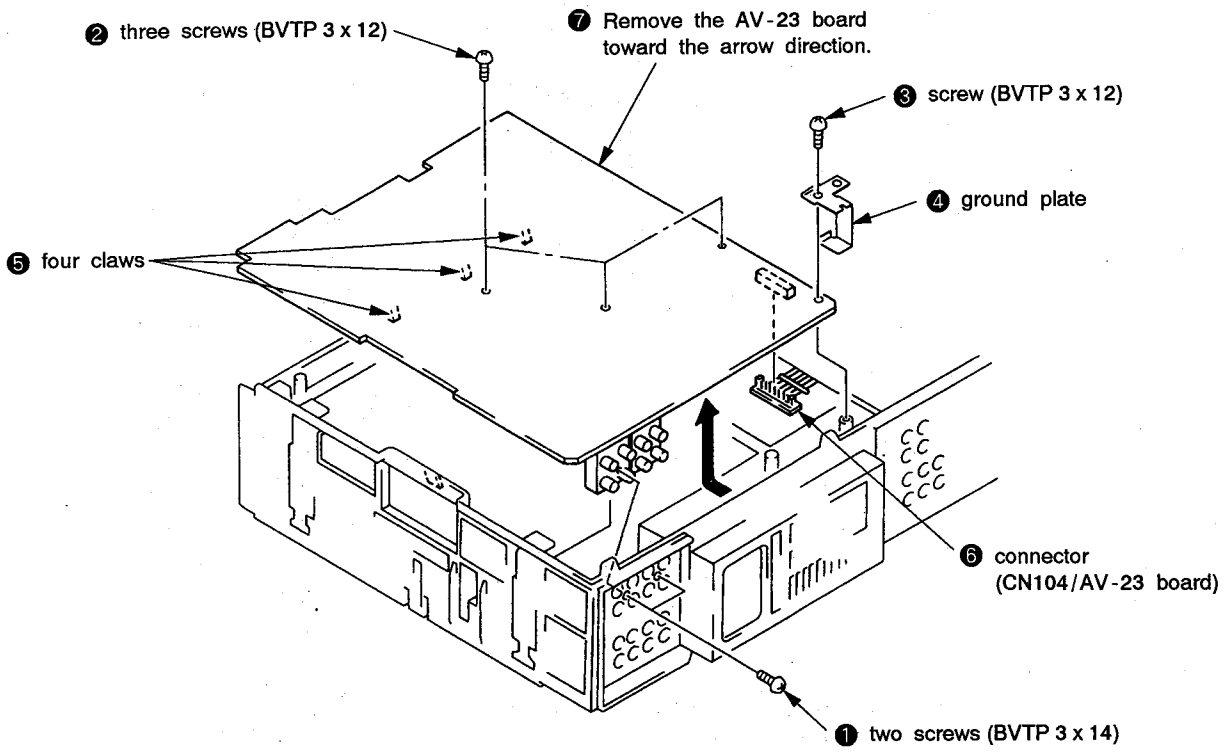
2-10. REMOVAL OF FL CASSETTE COMPARTMENT ASSEMBLY



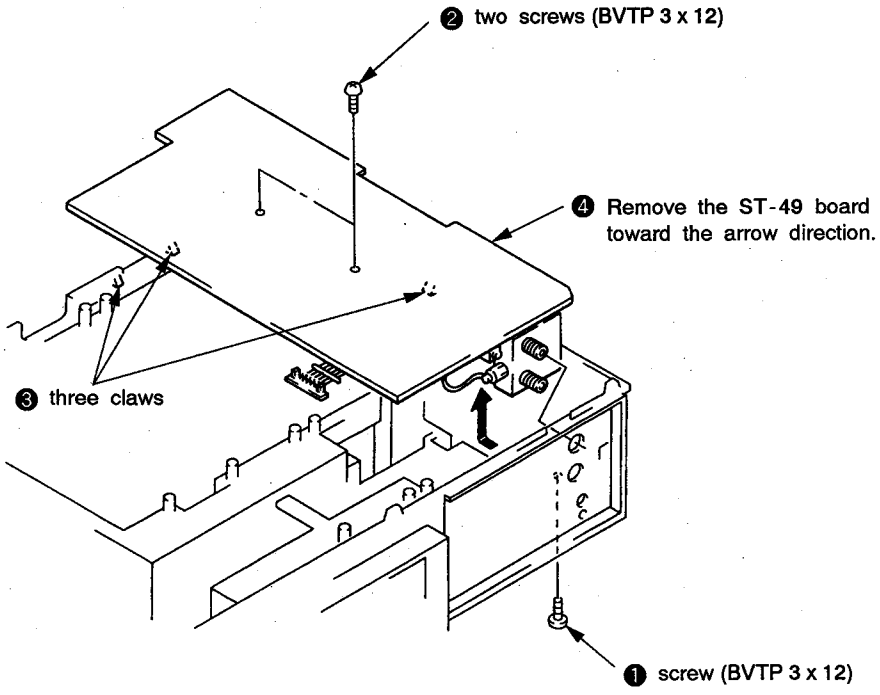
2-11. REMOVAL OF RP-158 BOARD AND MD BLOCK ASSEMBLY


❹ two screws (BVTP 3 x 12)
❺ RP-158 board
❸ flexble board (CN801/RP-158 board)
❼ connector (ACE head)
❻ connector (FE head)
❽ screw (BVTP 3 x 12)
❾ screws (BVTP 3 x 12)
❿ MD letainer (L)
❷ board to board connector (CN106/RP-158 board)
⓯ MD block ass'y
⓭ two board to board connectors (CN501, 502/ST-49 board)
⓫ screw (BVTP 3 x 12)
❶ board to board connector (CN508/RP-158 board)
⓬ MD bracket (front)

2-12. REMOVAL OF AV-23 BOARD

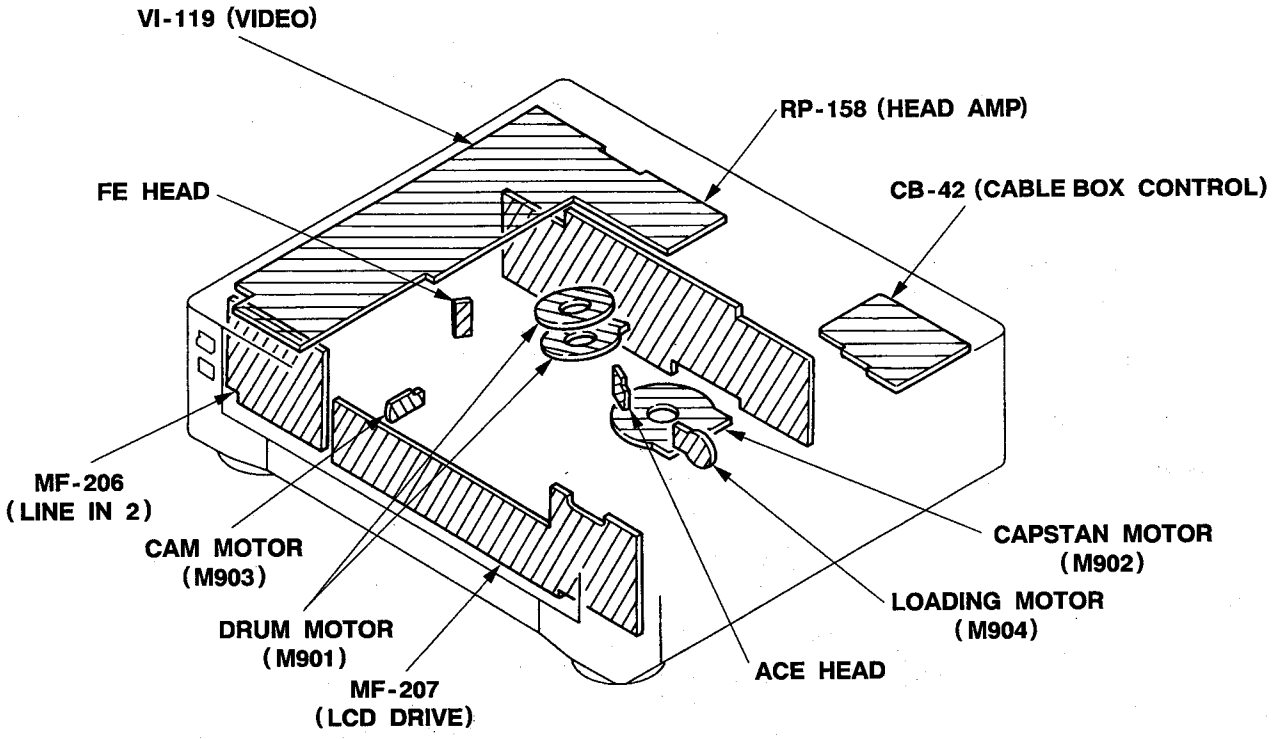

❷ three screws (BVTP 3 x 12)
❼ Remove the AV-23 board toward the arrow direction.
❸ screw (BVTP 3 x 12)
❹ ground plate
❺ four claws
❻ connector (CN104/AV-23 board)
❶ two screws (BVTP 3 x 14)

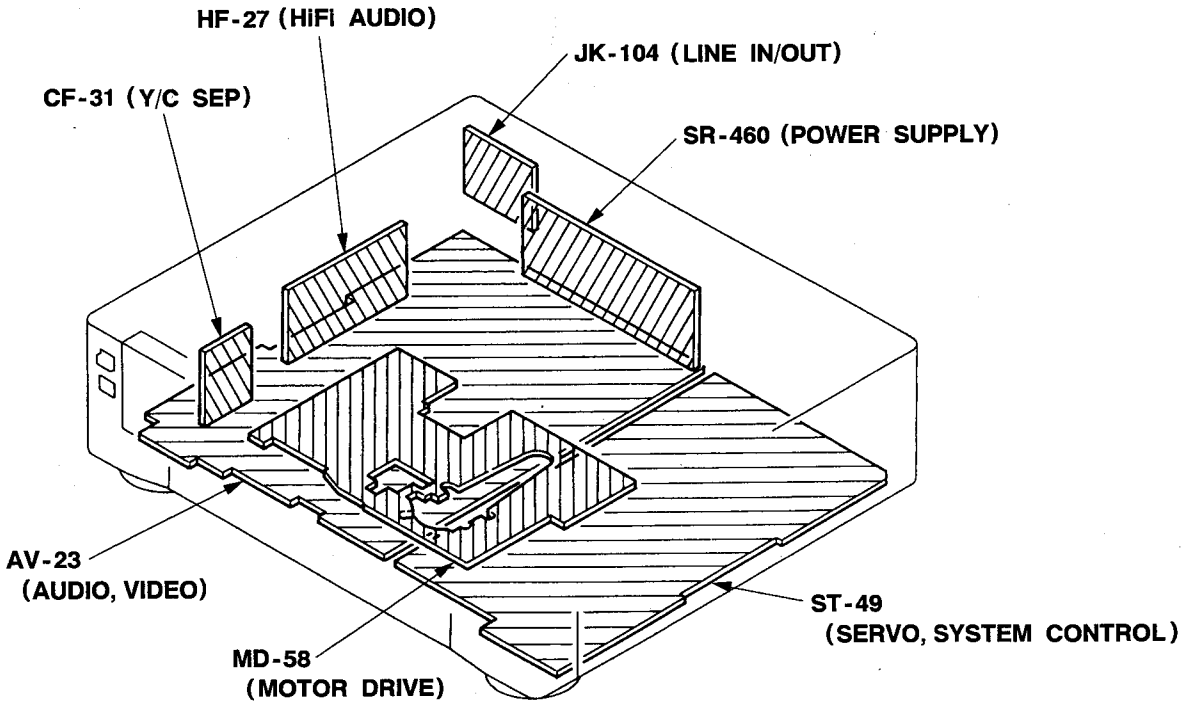
2-13. REMOVAL OF ST-49 BOARD



SECTION 3
DIAGRAMS

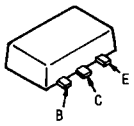
3-1. CIRCUIT BOARDS LOCATION



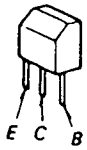


4-3. SEMICONDUCTOR LEAD LAYOUTS

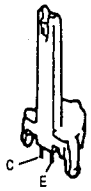
DTA144EK
MSB709-RT1
MSD601-RT1
UN211L
UN2111
UN2211
UN2212
UN2213AI
UN2219-TX
2SA1162
2SB709A-Q
2SB709A-S
2SB1000A-L
2SC1623-L5L6
2SC2712-G
2SD601A-S



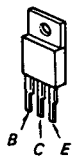
KSC1008
2SC4040-TL2-Q



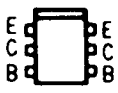
PT483F1S



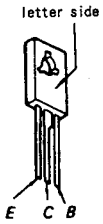
2SA473



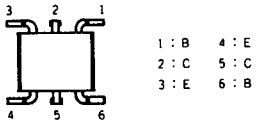
2SA1237F-6B



2SB889F

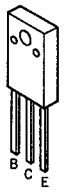


2SC3064

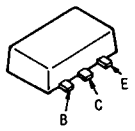


2SC3377

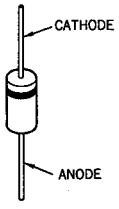
2SC4056



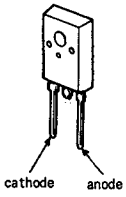
2SD999-CLCK
2SD1622-S



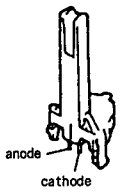
AG01A
AU02Z
ERA15-02
ERA15-06



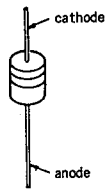
D4L20U
D5S4M



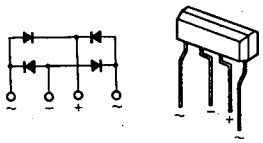
GL451VS1



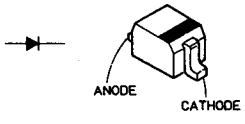
HZS33NB1
MA165
MA2150
MA4030
MTZJ-4.7
MTZJ-T-72-4.3
RD4.7ES-B2
RD6.2ES-B2
1SS119
11ES2



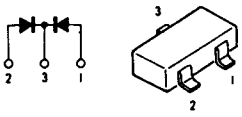
LB-156



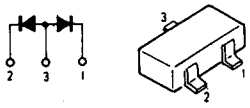
MA110



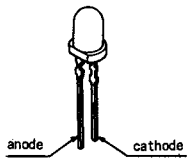
MA152WK



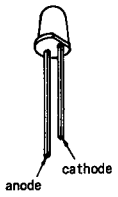
1S2836



SLR34DC3



SLR34MC3
SLR34VC3



SECTION 5 EXPLODED VIEWS

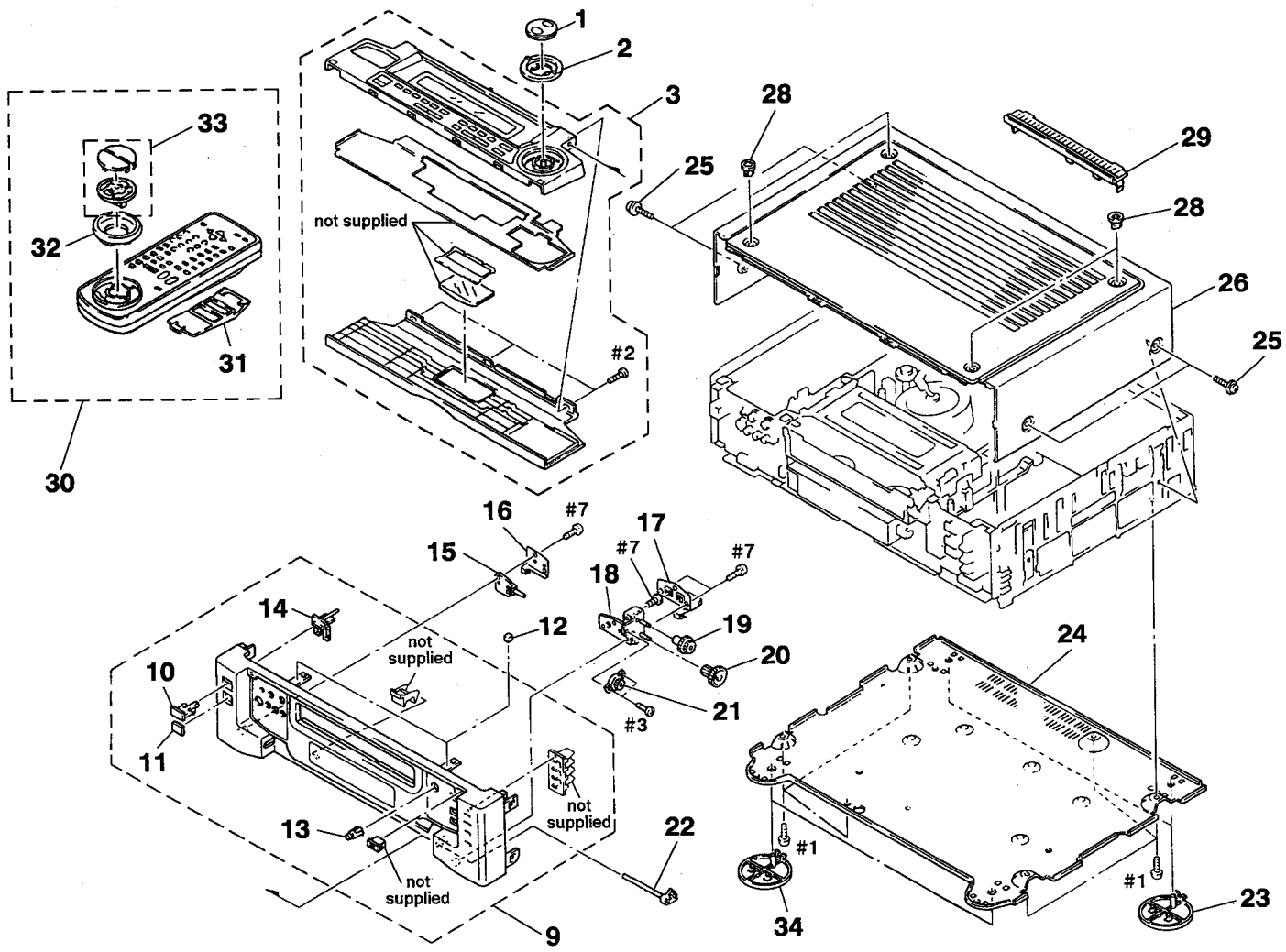
NOTE:

- -XX,-X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

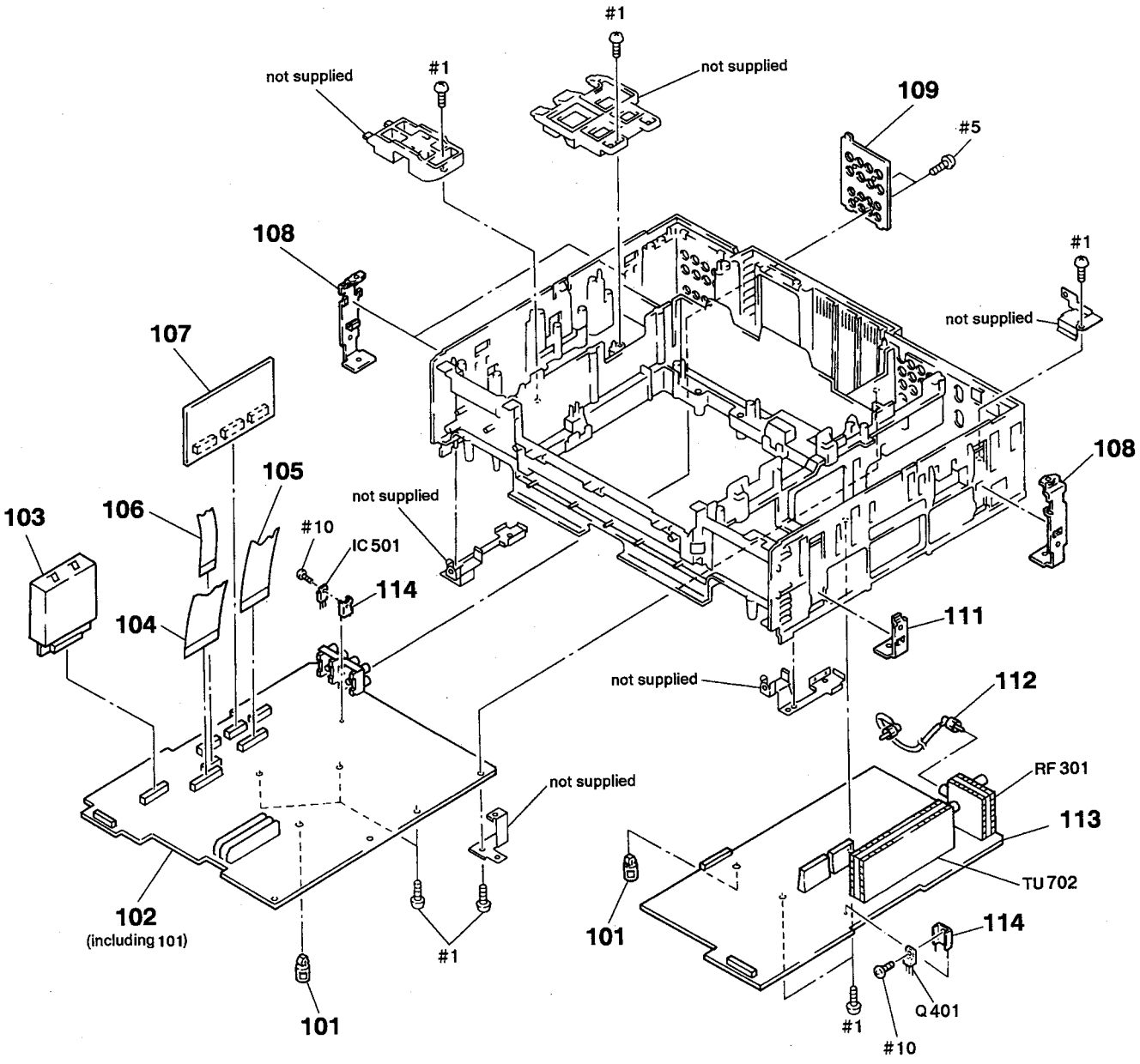
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

5-1. FRONT PANEL AND CABINET ASSEMBLIES



Ref. No.	Part No.	Description	Remark
1	X-3943-095-1	BUTTON ASSY, FUNCTION	
2	3-953-514-11	RING, SHUTTLE	
3	1-467-096-21	SWITCH BLOCK, CONTROL	
9	X-3943-094-1	PANEL ASSY, FRONT	
10	3-953-491-11	BUTTON, POWER	
11	3-946-620-01	FILTER, REMOTE CONTROL	
12	3-721-719-01	SPACER, H HEAT SINK	
13	3-953-498-11	BUTTON, ORC (APC)	
14	3-953-492-01	LENS, POWER	
15	X-3942-825-1	SHAFT (L) ASSY, FULCRUM	
* 16	3-953-515-01	PLATE (L), GROUND, PANEL	
* 17	3-953-516-01	PLATE (R), GROUND, PANEL	
* 18	X-3942-827-1	BASE ASSY, DAMPER	
19	3-953-506-01	GEAR (B), RELAY	
20	3-953-505-01	GEAR (A), RELAY	
21	3-712-786-51	DAMPER, OIL	
22	X-3942-826-1	SHAFT (R) ASSY, FULCRUM	
23	3-953-535-11	FOOT, ORNAMENT	
* 24	3-953-534-01	PLATE, BOTTOM	
25	3-947-364-01	SCREW, UPPER COVER TAPPING	
* 26	3-954-653-01	CASE, UPPER	
28	3-953-526-11	FASTENER, TOP ORNAMENTAL	
29	3-954-652-11	COVER, PS	
30	1-467-098-11	REMOTE COMMANDER (RMT-V129A)	
31	3-943-535-01	COVER, BATTERY	
32	3-951-746-01	RING, SHUTTLE	
33	X-3942-484-1	BUTTON ASSY, FUNCTION	
34	3-953-535-21	FOOT, ORNAMENT	

5-3. CHASSIS ASSEMBLY



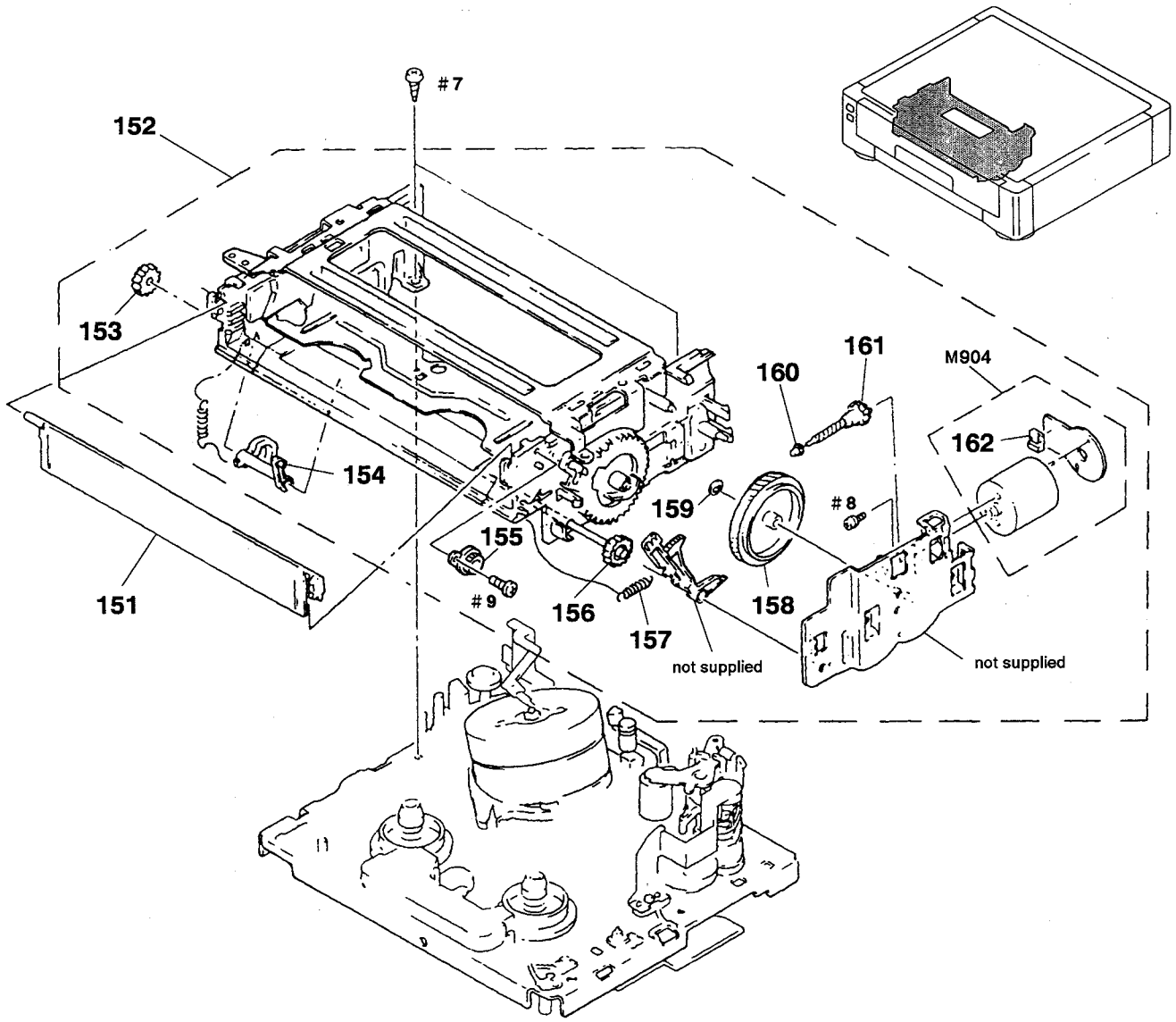
Ref. No.	Part No.	Description	Remark
101	3-682-057-21	SPACER (SMALL)	
* 102	A-6727-499-A	AV-23 BOARD, COMPLETE	
* 103	A-6756-969-A	CF-31 BOARD, COMPLETE	
104	1-751-174-12	CABLE, FLEXIBLE FLAT (29 CORE)	(FSA-1)
105	1-751-175-12	CABLE, FLEXIBLE FLAT (27 CORE)	(FVA-1)
106	1-751-176-12	CABLE, FLEXIBLE FLAT (15 CORE)	(FVA-2)
* 107	A-6721-548-A	HF-27 BOARD, COMPLETE	
* 108	3-953-520-01	BRACKET (LARGE), UPPER COVER	
109	3-953-540-11	PLATE, REAR JACK (A)	
* 111	3-741-992-01	STOPPER, UPPER CASE	
112	1-558-924-21	CABLE, PIN	
* 113	A-6782-056-A	ST-49 BOARD, COMPLETE	

Ref. No.	Part No.	Description	Remark
* 114	3-741-933-01	HEAT SINK	
⚠IC501	8-759-513-72	IC PQ12RF11	
Q401	8-729-141-83	TRANSISTOR 2SA473	
⚠RF301	1-466-989-11	MODULATOR, RF (VHF/UHF)	
⚠TU702	8-598-039-00	TUNER BTF-WA401	

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

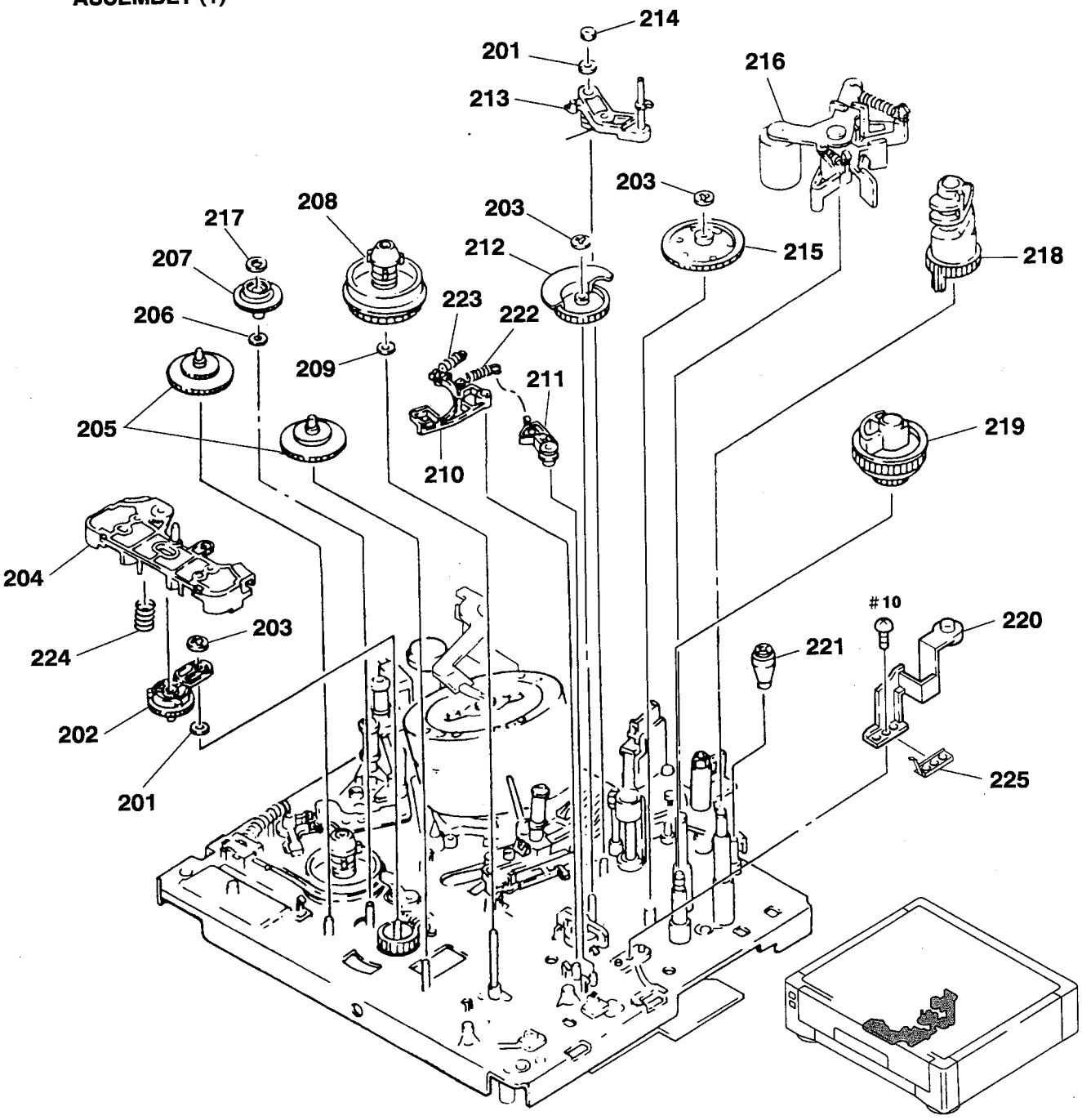
Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

5-4. FL CASSETE COMPARTMENT ASSEMBLY



Ref. No.	Part No.	Description	Remark
151	3-945-199-61	DOOR, FL	
* 152	A-6751-475-A	FL BLOCK ASSY (SX)	
153	3-736-044-02	GEAR (LEFT), MIDWAY	
154	3-736-163-01	LEVER, ERASING PROTECTION	
155	3-953-235-01	DAMPER, OIL	
156	X-3727-775-2	GEAR (RIGHT) ASSY, MIDWAY	
157	3-953-236-01	SPRING (DOOR SWITCHING S)	
158	3-736-164-01	WHEEL (FL), WORM	
159	3-696-510-01	WASHER (3), STOPPER	
160	3-716-144-02	RETAINER, WORM	
161	3-736-100-01	GEAR (FL), WORM	
* 162	1-564-013-11	PIN, CONNECTOR 3P	
M904	X-3727-784-1	MOTOR ASSY (LOADING)	

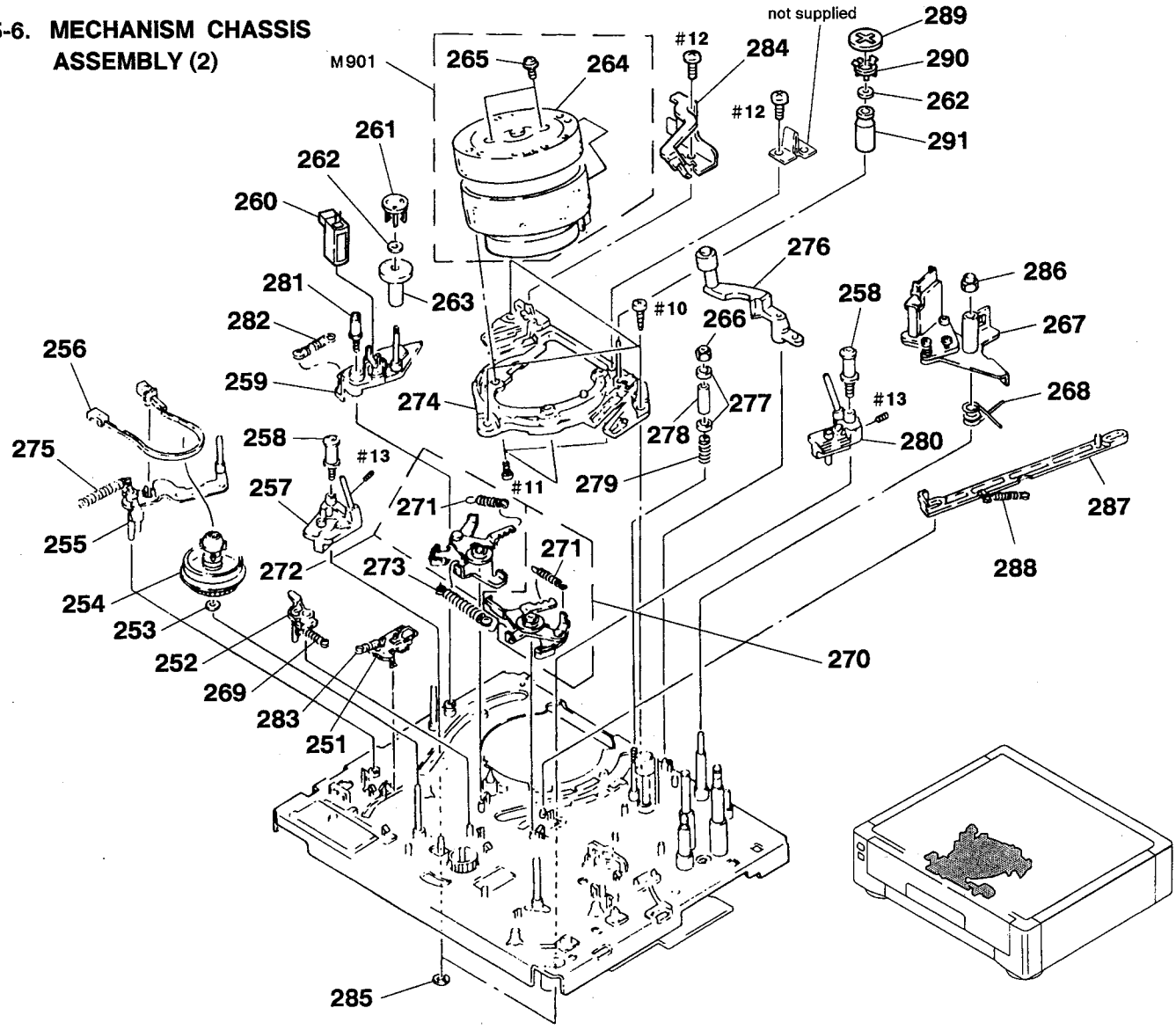
5-5. MECHANISM CHASSIS ASSEMBLY (1)



Ref. No.	Part No.	Description	Remark
201	3-701-438-11	WASHER, 2.5	
202	X-3727-776-1	ARM ASSY, PENDULUM	
203	3-669-595-00	WASHER (2), STOPPER	
204	3-736-172-02	RELEASE, LOCK, REEL	
205	X-3727-795-1	GEAR ASSY, RELAY	
206	3-736-074-01	RETAINER (SMALL), THRUST	
207	3-736-037-01	GEAR, REW	
208	X-3727-798-1	TABLE ASSY, REEL	
209	3-738-212-21	RETAINER, THRUST, REEL TABLE	
210	X-3733-335-1	BRAKE ASSY (AT), T SOFT	
211	3-736-105-01	ARM, REV BRAKE	
212	3-736-143-01	GEAR, RVS CAM	
213	X-3942-218-1	ARM ASSY, RVS	

Ref. No.	Part No.	Description	Remark
214	3-736-740-01	NUT (M2X0.25), NYLON	
215	3-736-116-01	GEAR, COMMUNICATION	
216	X-3727-770-1	PINCH ROLLER BLOCK ASSY	
217	3-736-069-01	RETAINER, SPRING	
218	3-952-182-01	CAM, ELEVATOR	
219	3-943-700-01	GEAR (LO), PRESS CAM	
220	3-942-828-01	OPENNER, LID	
221	3-738-250-01	SCREW, AC ADJUSTMENT	
222	3-736-025-01	SPRING (REV BRAKE), TENSION	
223	3-736-024-01	SPRING, TENSION	
224	3-736-020-11	SPRING, COMPRESSION	
225	3-942-829-01	SPRING (2) (ATOM), GROUND, FL	

5-6. MECHANISM CHASSIS ASSEMBLY (2)



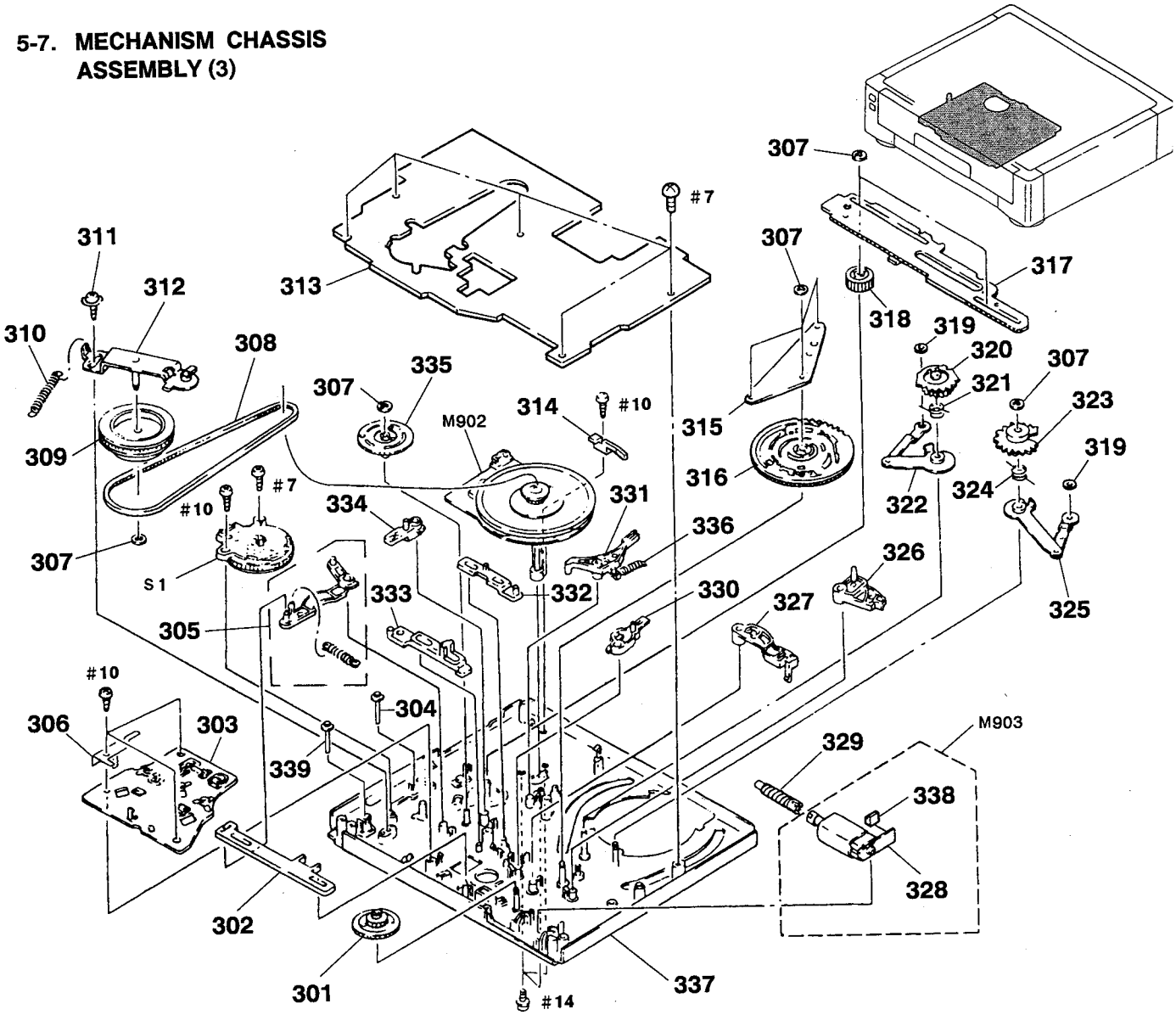
Ref. No.	Part No.	Description	Remark
251	A-6759-483-A	TAKE-UP BLOCK ASSY (AT), S	
252	3-736-075-01	BRAKE, S SOFT	
253	3-738-212-21	RETAINER, THRUST, REEL TABLE	
254	X-3941-194-1	TABLE ASSY, REEL, S	
255	3-736-151-11	ARM (POM), TENSION REGULATOR	
256	X-3727-797-1	BAND ASSY, TENSION REGULATOR	
257	X-3727-786-1	SHUTTLE (LEFT) ASSY	
258	X-3733-301-1	ROLLER ASSY, GUIDE	
259	X-3727-767-1	BASE ASSY, STABILIZER	
260	1-543-647-11	HEAD, FE	
261	3-736-082-01	RETAINER, TS THRUST	
262	3-741-925-01	RING, RETAINING	
263	X-3942-759-1	STABILIZER ASSY (SX), TAPE	
264	8-848-607-01	DRUM ASSY, ROTARY UPPER (DZR-61-R)	
265	2-643-205-01	SCREW (PSW) 3X8	
266	3-942-866-01	NUT (M3) (3X0.5), NYLON	
267	A-6761-129-C	HEAD BLOCK ASSY, ACE	
268	3-944-833-01	SPRING, TORSION	
269	3-736-047-01	SPRING (S SOFT), TENSION	
270	X-3729-926-1	BRAKE ASSY (2), T	
271	3-738-220-01	SPRING (MAIN BRAKE 2), TENSION	
272	X-3733-336-2	BRAKE ASSY (2) (AT), S	
273	3-738-221-01	SPRING (MAIN BRAKE 1), TENSION	
274	X-3743-511-4	BASE ASSY (S), DRUM	
275	3-733-389-11	SPRING, TENSION	

Ref. No.	Part No.	Description	Remark
276	A-6747-267-A	ARM BLOCK ASSY (S), C ROLLER	
277	3-944-033-01	FLANGE, 7 GUIDE	
278	3-736-730-01	SLEEVE, #7 GUIDE	
279	3-749-099-01	SPRING (#7 GUIDE), COMPRESSION	
280	X-3727-787-1	SHUTTLE (RIGHT) ASSY	
281	X-3727-788-1	ROLLER ASSY, GUIDE, #2	
282	3-736-745-01	SPRING	
283	3-738-284-01	SPRING, TENSION	
284	X-3733-304-1	GROUND ASSY, SHAFT	
285	3-736-073-01	SLIDER, POLYETHYLENE	
286	3-942-867-01	NUT, AC HEIGHT ADJUSTMENT	
287	X-3743-517-1	LEVER (S), RELEASE, C ROLLER	
288	3-736-735-03	SPRING, TENSION	
289	3-953-239-01	WEIGHT, DTS	
290	3-953-238-01	CAP, DTS	
291	X-3743-510-1	ROLLER ASSY, DTS	
⚠M901	8-848-606-11	DRUM ASSY (DZH-61A-R)	

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

5-7. MECHANISM CHASSIS ASSEMBLY (3)



Ref. No.	Part No.	Description	Remark
301	3-736-015-01	WHEEL (CAM), WORM	
302	3-736-158-01	PLATE, SLIDE, PENDULUM	
303	A-6739-084-A	CHASSIS BLOCK ASSY, SUB	
304	3-736-091-01	PIN, SWITCH	
305	X-3729-924-1	ARM ASSY, PENDULUM FUNCTION	
306	3-741-950-01	SPRING (AT), LEAF, SC GROUND	
307	3-669-595-00	WASHER (2), STOPPER	
308	3-736-013-01	BELT, TIMING	
309	X-3727-782-1	PULLEY ASSY	
310	3-736-089-01	SPRING, TENSION	
311	3-733-386-01	SCREW (3X8), WASHER	
312	X-3727-761-1	ARM ASSY, ADJUSTMENT	
* 313	A-6754-505-A	MD-58 BOARD, COMPLETE	
314	3-736-744-01	RETAINER, ROTOR	
315	3-733-396-01	HOLDER, CAM GEAR	
316	3-736-176-01	GEAR, CAM	
317	3-736-177-01	PLATE, SLIDE, MODE	
318	3-733-394-01	GEAR, RVS RELAY	
319	3-736-069-01	RETAINER, SPRING	
320	3-736-148-01	GEAR (RIGHT), THREADING	
321	3-736-092-01	SPRING (RIGHT), TORSION	
322	X-3727-777-1	ARM (RIGHT) ASSY, THREADING	
323	3-736-147-01	GEAR (LEFT), THREADING	
324	3-736-040-01	SPRING (LEFT), TORSION	
325	X-3727-778-1	ARM (LEFT) ASSY, THREADING	

Ref. No.	Part No.	Description	Remark
326	3-736-142-01	ARM, TENSION REGULATOR FUNCTION	
327	3-736-140-01	ARM, S TAKE-UP	
* 328	1-633-460-11	CA-41 BOARD	
329	3-733-395-01	GEAR (CAM), WORM	
330	3-733-397-01	ARM, BRAKE FUNCTION	
331	X-3733-338-1	BRAKE ASSY (AT), CAP	
332	3-733-398-01	PLATE, SLIDE, BRAKE	
333	3-736-103-01	PLATE, SLIDE, LIMITER	
334	3-736-016-01	ARM, LIMITER FUNCTION	
335	3-736-170-01	GEAR, RKB CAM	
336	3-738-237-01	SPRING (CAP BRAKE), TENSION	
* 337	A-6773-084-A	MD BLOCK ASSY	
* 338	1-564-013-11	PIN, CONNECTOR 3P	
339	3-743-574-01	PIN, S SWITCH (S CASSETTE)	
⚠M902	8-835-489-01	MOTOR, DC U-26K (CAPSTAN)	
M903	X-3733-302-1	MOTOR ASSY, CAM	
S1	1-692-062-11	SWITCH, ROTARY (CAM ENCODER)	

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

AV-23

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL:Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F:nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u:μ, for example:
  uA ..: μA.. uPA..: μPA..
  uPB..: μPB.. uPC..: μPC.. uPD..: μPD..
- CAPACITORS
  uF: μF
- COILS
  uH: μH

When indicating parts by reference number, please include the board.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remark
*	A-6727-499-A	AV-23 BOARD, COMPLETE			
		**********			
		(Ref. No. 3,000 Series)			
*	3-741-933-01	HEAT SINK			
		< CAPACITOR >			
C101	1-124-126-00	ELECT	47uF	20%	10V
C102	1-163-103-00	CERAMIC CHIP	27PF	5%	50V
C103	1-163-095-00	CERAMIC CHIP	12PF	5%	50V
C104	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C105	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C106	1-124-463-00	ELECT	0.1uF	20%	50V
C107	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C108	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C109	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C110	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C112	1-163-119-00	CERAMIC CHIP	120PF	5%	50V
C113	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C114	1-163-132-00	CERAMIC CHIP	430PF	5%	50V
C115	1-163-103-00	CERAMIC CHIP	27PF	5%	50V
C116	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C117	1-163-111-00	CERAMIC CHIP	56PF	5%	50V
C118	1-124-443-00	ELECT	100uF	20%	10V
C119	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C120	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C121	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C122	1-163-111-00	CERAMIC CHIP	56PF	5%	50V
C124	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C125	1-163-101-00	CERAMIC CHIP	22PF	5%	50V
C128	1-124-126-00	ELECT	47uF	20%	10V
C129	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C130	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C131	1-124-443-00	ELECT	100uF	20%	10V
C132	1-124-927-11	ELECT	4.7uF	20%	100V
C134	1-124-927-11	ELECT	4.7uF	20%	100V
C135	1-124-927-11	ELECT	4.7uF	20%	100V
C136	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C137	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C139	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C140	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C141	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C143	1-124-126-00	ELECT	47uF	20%	10V
C144	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C145	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C146	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C147	1-124-927-11	ELECT	4.7uF	20%	100V
C148	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C149	1-163-093-00	CERAMIC CHIP	10PF	5%	50V
C150	1-124-443-00	ELECT	100uF	20%	10V
C151	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C152	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C153	1-163-139-00	CERAMIC CHIP	820PF	5%	50V
C154	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C155	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C156	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C157	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C159	1-163-222-11	CERAMIC CHIP	5PF	0.25PF	50V
C160	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C161	1-124-927-11	ELECT	4.7uF	20%	100V
C162	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C163	1-163-102-00	CERAMIC CHIP	24PF	5%	50V
C164	1-124-443-00	ELECT	100uF	20%	10V
C165	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C166	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C167	1-124-463-00	ELECT	0.1uF	20%	50V
C168	1-124-463-00	ELECT	0.1uF	20%	50V
C169	1-124-903-11	ELECT	1uF	20%	50V
C170	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C171	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C172	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C173	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C175	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C176	1-163-110-00	CERAMIC CHIP	51PF	5%	50V
C201	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C202	1-163-128-00	CERAMIC CHIP	300PF	5%	50V
C203	1-163-127-00	CERAMIC CHIP	270PF	5%	50V
C204	1-163-128-00	CERAMIC CHIP	300PF	5%	50V
C205	1-163-128-00	CERAMIC CHIP	300PF	5%	50V

Ref. No.	Part No.	Description		Remark	
C206	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C207	1-163-123-00	CERAMIC CHIP	180PF	5%	50V
C208	1-163-115-00	CERAMIC CHIP	82PF	5%	50V
C209	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C210	1-126-163-11	ELECT	4. 7uF	20%	50V
C211	1-124-257-00	ELECT	2. 2uF	20%	50V
C212	1-124-257-00	ELECT	2. 2uF	20%	50V
C213	1-124-126-00	ELECT	47uF	20%	10V
C214	1-124-584-00	ELECT	100uF	20%	10V
C215	1-163-038-00	CERAMIC CHIP	0. 1uF		25V
C220	1-163-038-00	CERAMIC CHIP	0. 1uF		25V
C301	1-124-589-11	ELECT	47uF	20%	16V
C302	1-163-038-00	CERAMIC CHIP	0. 1uF		25V
C303	1-163-038-00	CERAMIC CHIP	0. 1uF		25V
C304	1-124-589-11	ELECT	47uF	20%	16V
C305	1-163-038-00	CERAMIC CHIP	0. 1uF		25V
C306	1-163-038-00	CERAMIC CHIP	0. 1uF		25V
C307	1-163-038-00	CERAMIC CHIP	0. 1uF		25V
C308	1-163-038-00	CERAMIC CHIP	0. 1uF		25V
C309	1-163-038-00	CERAMIC CHIP	0. 1uF		25V
C310	1-163-038-00	CERAMIC CHIP	0. 1uF		25V
C311	1-163-038-00	CERAMIC CHIP	0. 1uF		25V
C312	1-124-589-11	ELECT	47uF	20%	16V
C313	1-163-038-00	CERAMIC CHIP	0. 1uF		25V
C314	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C315	1-163-103-00	CERAMIC CHIP	27PF	5%	50V
C316	1-163-115-00	CERAMIC CHIP	82PF	5%	50V
C317	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C318	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C401	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C402	1-163-009-11	CERAMIC CHIP	0. 001uF	10%	50V
C404	1-163-222-11	CERAMIC CHIP	5PF	0. 25PF	50V
C405	1-126-163-11	ELECT	4. 7uF	20%	50V
C406	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C407	1-163-038-00	CERAMIC CHIP	0. 1uF		25V
C408	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C409	1-124-927-11	ELECT	4. 7uF	20%	100V
C410	1-163-245-11	CERAMIC CHIP	56PF	5%	50V
C411	1-124-916-11	ELECT	22uF	20%	63V
C412	1-164-232-11	CERAMIC CHIP	0. 01uF		50V
C413	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C414	1-164-232-11	CERAMIC CHIP	0. 01uF		50V
C415	1-124-902-00	ELECT	0. 47uF	20%	50V
C417	1-124-902-00	ELECT	0. 47uF	20%	50V
C418	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C419	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C420	1-124-903-11	ELECT	1uF	20%	50V
C421	1-163-129-00	CERAMIC CHIP	330PF	5%	50V

Ref. No.	Part No.	Description		Remark	
C422	1-124-927-11	ELECT	4. 7uF	20%	100V
C423	1-164-232-11	CERAMIC CHIP	0. 01uF		50V
C424	1-124-903-11	ELECT	1uF	20%	50V
C425	1-124-927-11	ELECT	4. 7uF	20%	100V
C426	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C427	1-164-232-11	CERAMIC CHIP	0. 01uF		50V
C428	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C429	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C430	1-124-443-00	ELECT	100uF	20%	10V
C431	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C432	1-124-927-11	ELECT	4. 7uF	20%	100V
C433	1-124-126-00	ELECT	47uF	20%	10V
C434	1-124-443-00	ELECT	100uF	20%	10V
C435	1-163-038-00	CERAMIC CHIP	0. 1uF		25V
C436	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C437	1-124-126-00	ELECT	47uF	20%	10V
C438	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C439	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C440	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C441	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C442	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C443	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C444	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C445	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C447	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C448	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C449	1-164-161-11	CERAMIC CHIP	0. 0022uF	10%	100V
C450	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C451	1-163-038-00	CERAMIC CHIP	0. 1uF		25V
C452	1-163-038-00	CERAMIC CHIP	0. 1uF		25V
C453	1-126-160-11	ELECT	1uF	20%	50V
C454	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C455	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C457	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C458	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C459	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C460	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C461	1-163-103-00	CERAMIC CHIP	27PF	5%	50V
C463	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C501	1-124-589-11	ELECT	47uF	20%	16V
C502	1-126-101-11	ELECT	100uF	20%	16V
C503	1-124-589-11	ELECT	47uF	20%	16V
C510	1-124-589-11	ELECT	47uF	20%	16V
C512	1-124-589-11	ELECT	47uF	20%	16V
C513	1-163-031-11	CERAMIC CHIP	0. 01uF		50V
C514	1-163-095-00	CERAMIC CHIP	12PF	5%	50V
C515	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C516	1-124-589-11	ELECT	47uF	20%	16V
C517	1-124-126-00	ELECT	47uF	20%	10V

Ref. No.	Part No.	Description			Remark
C518	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C601	1-124-925-11	ELECT	2.2uF	20%	100V
C611	1-124-925-11	ELECT	2.2uF	20%	100V
C612	1-124-907-11	ELECT	10uF	20%	50V
C618	1-124-477-11	ELECT	47uF	20%	25V
C619	1-124-477-11	ELECT	47uF	20%	25V
C620	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C622	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C651	1-124-477-11	ELECT	47uF	20%	25V
C652	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C654	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C655	1-124-477-11	ELECT	47uF	20%	25V
C660	1-124-907-11	ELECT	10uF	20%	50V
C701	1-124-589-11	ELECT	47uF	20%	16V
C702	1-124-584-00	ELECT	100uF	20%	10V
C710	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C712	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C713	1-163-124-00	CERAMIC CHIP	200PF	5%	50V
C852	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C853	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C854	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C855	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V
C856	1-137-612-11	FILM	0.0068uF	5%	100V
C857	1-104-697-11	FILM	0.047uF	5%	100V
C858	1-104-695-11	FILM	330PF	5%	100V
C859	1-126-101-11	ELECT	100uF	20%	16V
C860	1-126-101-11	ELECT	100uF	20%	16V
C861	1-130-491-00	MYLAR	0.047uF	5%	50V
C901	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C902	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C908	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C910	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C911	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C912	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C913	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C914	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C916	1-163-224-11	CERAMIC CHIP	7PF	0.25PF	50V
C917	1-124-126-00	ELECT	47uF	20%	10V
C918	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C919	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C920	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C921	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C922	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C923	1-163-087-00	CERAMIC CHIP	4PF		50V
C924	1-163-085-00	CERAMIC CHIP	2PF		50V
C925	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C926	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C929	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C930	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C931	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C933	1-163-038-00	CERAMIC CHIP	0.1uF		25V

< JACK >

CJ001	1-565-258-11	JACK, PIN 4P (LINE OUT 1, 3 (AUDIO))	
CJ002	1-565-258-11	JACK, PIN 4P (LINE IN 1, 3 (AUDIO))	

< CONNECTOR >

CN001	1-573-846-11	CONNECTOR, BOARD TO BOARD 14P	
CN101	1-506-470-11	PIN, CONNECTOR 5P	
* CN102	1-564-029-00	PIN, CONNECTOR 4P	
CN103	1-691-698-11	CONNECTOR, BOARD TO BOARD 12P	
CN104	1-569-338-11	CONNECTOR, BOARD TO BOARD 19P	
CN105	1-695-352-11	PIN, CONNECTOR (PC BOARD) 29P	
CN106	1-569-341-11	CONNECTOR, BOARD TO BOARD 19P	
CN108	1-695-350-11	PIN, CONNECTOR (PC BOARD) 27P	
CN109	1-695-338-11	PIN, CONNECTOR (PC BOARD) 15P	
* CN805	1-560-891-00	PIN, CONNECTOR 3P	
CN851	1-695-939-11	CONNECTOR, BOARD TO BOARD 18P	
CN852	1-695-939-11	CONNECTOR, BOARD TO BOARD 18P	
CN853	1-695-939-11	CONNECTOR, BOARD TO BOARD 18P	
* CN854	1-560-892-00	PIN, CONNECTOR 4P	

< DIODE >

D101	8-719-911-19	DIODE	1SS119
D102	8-719-400-18	DIODE	MA152WK
D103	8-719-400-18	DIODE	MA152WK
D104	8-719-911-19	DIODE	1SS119
D105	8-719-911-19	DIODE	1SS119
D201	8-719-911-19	DIODE	1SS119
D401	8-719-911-19	DIODE	1SS119
D601	8-719-911-19	DIODE	1SS119
D602	8-719-911-19	DIODE	1SS119
D603	8-719-911-19	DIODE	1SS119
D604	8-719-911-19	DIODE	1SS119
D607	8-719-109-93	DIODE	RD6.2ES-B2
D610	8-719-109-93	DIODE	RD6.2ES-B2
D651	8-719-109-93	DIODE	RD6.2ES-B2
D652	8-719-109-93	DIODE	RD6.2ES-B2
D710	8-719-911-19	DIODE	1SS119
D711	8-719-911-19	DIODE	1SS119
D712	8-719-911-19	DIODE	1SS119

< DELAY LINE >

DL401	1-406-686-11	DELAY LINE, ULTRASONIC (GLASS)	
DL402	1-406-686-11	DELAY LINE, ULTRASONIC (GLASS)	
DL403	1-406-686-11	DELAY LINE, ULTRASONIC (GLASS)	

Ref. No.	Part No.	Description			Remark
		< FERRITE BEAD >			
FB301	1-543-610-11	BEAD, FERRITE			
		< FILTER >			
FL101	1-239-614-11	FILTER, LOW PASS			
FL401	1-406-715-11	COIL, TANK			
FL402	1-236-718-11	FILTER, BAND PASS			
FL403	1-236-928-11	FILTER, LOW PASS			
FL404	1-406-687-11	DELAY LINE, LC			
FL406	1-406-688-11	DELAY LINE, LC			
FL901	1-415-858-11	DELAY LINE			
FL902	1-415-858-11	DELAY LINE			
		< IC >			
IC101	8-759-098-21	IC AN3252FBS			
IC102	1-810-064-11	IC DSP MODULE (DS-64AN)			
IC201	8-759-504-09	IC VC2076			
IC301	8-752-353-92	IC CXL5005M-T4			
IC401	8-759-098-20	IC M52366FP			
IC402	8-759-509-29	IC XRU4011BF			
IC403	8-759-098-19	IC MM1109XS			
⚠IC501	8-759-513-72	IC PQ12RF11			
IC510	8-759-710-86	IC NJM2233BM			
IC601	8-759-700-43	IC NJM4558M			
IC609	8-759-745-64	IC NJM4560M-T1			
IC651	8-759-009-06	IC MC14052BF			
IC652	8-759-745-64	IC NJM4560M-T1			
⚠IC701	8-759-513-71	IC PQ05RF21			
IC901	8-759-012-00	IC MC10H116M			
		< JUMPER RESISTOR >			
JR001	1-216-296-00	METAL CHIP	0	5%	1/8W
JR002	1-216-295-00	METAL CHIP	0	5%	1/10W
JR003	1-216-296-00	METAL CHIP	0	5%	1/8W
JR004	1-216-295-00	METAL CHIP	0	5%	1/10W
JR005	1-216-295-00	METAL CHIP	0	5%	1/10W
JR006	1-216-295-00	METAL CHIP	0	5%	1/10W
JR007	1-216-295-00	METAL CHIP	0	5%	1/10W
JR009	1-216-295-00	METAL CHIP	0	5%	1/10W
JR010	1-216-295-00	METAL CHIP	0	5%	1/10W
JR011	1-216-295-00	METAL CHIP	0	5%	1/10W
JR012	1-216-296-00	METAL CHIP	0	5%	1/8W
JR013	1-216-295-00	METAL CHIP	0	5%	1/10W
JR015	1-216-295-00	METAL CHIP	0	5%	1/10W
JR017	1-216-295-00	METAL CHIP	0	5%	1/10W
JR018	1-216-295-00	METAL CHIP	0	5%	1/10W
JR019	1-216-295-00	METAL CHIP	0	5%	1/10W
JR020	1-216-295-00	METAL CHIP	0	5%	1/10W
JR021	1-216-295-00	METAL CHIP	0	5%	1/10W
JR023	1-216-295-00	METAL CHIP	0	5%	1/10W
JR024	1-216-296-00	METAL CHIP	0	5%	1/8W
JR025	1-216-295-00	METAL CHIP	0	5%	1/10W
JR026	1-216-295-00	METAL CHIP	0	5%	1/10W
JR027	1-216-296-00	METAL CHIP	0	5%	1/8W
JR028	1-216-296-00	METAL CHIP	0	5%	1/8W
JR029	1-216-296-00	METAL CHIP	0	5%	1/8W
JR030	1-216-295-00	METAL CHIP	0	5%	1/10W
JR031	1-216-296-00	METAL CHIP	0	5%	1/8W
JR032	1-216-296-00	METAL CHIP	0	5%	1/8W
JR033	1-216-295-00	METAL CHIP	0	5%	1/10W
JR034	1-216-296-00	METAL CHIP	0	5%	1/8W
JR035	1-216-295-00	METAL CHIP	0	5%	1/10W
JR036	1-216-296-00	METAL CHIP	0	5%	1/8W
JR037	1-216-295-00	METAL CHIP	0	5%	1/10W
JR038	1-216-295-00	METAL CHIP	0	5%	1/10W
JR039	1-216-295-00	METAL CHIP	0	5%	1/10W
JR040	1-216-295-00	METAL CHIP	0	5%	1/10W
JR041	1-216-295-00	METAL CHIP	0	5%	1/10W
JR042	1-216-296-00	METAL CHIP	0	5%	1/8W
JR043	1-216-295-00	METAL CHIP	0	5%	1/10W
JR044	1-216-295-00	METAL CHIP	0	5%	1/10W
JR045	1-216-295-00	METAL CHIP	0	5%	1/10W
JR046	1-216-295-00	METAL CHIP	0	5%	1/10W
JR710	1-216-296-00	METAL CHIP	0	5%	1/8W
JR992	1-216-295-00	METAL CHIP	0	5%	1/10W
JR994	1-216-296-00	METAL CHIP	0	5%	1/8W
JR995	1-216-295-00	METAL CHIP	0	5%	1/10W
JR996	1-216-295-00	METAL CHIP	0	5%	1/10W
JR997	1-216-295-00	METAL CHIP	0	5%	1/10W
JR998	1-216-296-00	METAL CHIP	0	5%	1/8W
JR999	1-216-295-00	METAL CHIP	0	5%	1/10W
		< RESISTOR >			
JW031	1-249-413-11	CARBON	470	5%	1/4W F
JW032	1-249-413-11	CARBON	470	5%	1/4W F
		< COIL >			
JW234	1-412-488-11	INDUCTOR 1UH			
JW278	1-410-526-11	INDUCTOR 10UH			
		< RESISTOR >			
JW279	1-249-417-11	CARBON	1K	5%	1/4W F
		< COIL >			
JW281	1-410-526-11	INDUCTOR 10UH			

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

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Ref. No.	Part No.	Description	Remark
		< RESISTOR >	
JW283	1-249-417-11	CARBON 1K 5% 1/4W F	
		< COIL >	
JW293	1-410-526-11	INDUCTOR 10UH	
JW989	1-410-526-11	INDUCTOR 10UH	
		< COIL >	
L102	1-412-508-11	INDUCTOR 56uH	
L104	1-412-510-11	INDUCTOR 82uH	
L105	1-410-527-11	INDUCTOR 100uH	
L106	1-410-527-11	INDUCTOR 100uH	
L107	1-410-513-11	INDUCTOR 22uH	
L109	1-410-521-11	INDUCTOR 100uH	
L110	1-410-521-11	INDUCTOR 100uH	
L111	1-412-511-11	INDUCTOR 120uH	
L112	1-412-510-11	INDUCTOR 82uH	
L113	1-412-513-11	INDUCTOR 180uH	
L114	1-412-510-11	INDUCTOR 82uH	
L116	1-408-418-00	INDUCTOR 56uH	
L117	1-412-498-11	INDUCTOR 6.8uH	
L118	1-412-496-11	INDUCTOR 4.7uH	
L119	1-412-512-11	INDUCTOR 150uH	
L120	1-408-421-00	INDUCTOR 100uH	
L201	1-410-513-11	INDUCTOR 22uH	
L301	1-410-521-11	INDUCTOR 100uH	
L302	1-410-521-11	INDUCTOR 100uH	
L303	1-410-526-11	INDUCTOR 10uH	
L304	1-412-501-11	INDUCTOR 15uH	
L305	1-412-488-11	INDUCTOR 1uH	
L306	1-412-500-11	INDUCTOR 12uH	
L401	1-410-527-11	INDUCTOR 100uH	
L403	1-414-191-11	INDUCTOR 150uH	
L404	1-410-513-11	INDUCTOR 22uH	
L405	1-410-513-11	INDUCTOR 22uH	
L406	1-412-501-11	INDUCTOR 15uH	
L407	1-412-501-11	INDUCTOR 15uH	
L408	1-410-513-11	INDUCTOR 22uH	
L409	1-412-501-11	INDUCTOR 15uH	
L410	1-412-501-11	INDUCTOR 15uH	
L411	1-412-501-11	INDUCTOR 15uH	
L412	1-412-501-11	INDUCTOR 15uH	
L413	1-408-429-00	INDUCTOR 470uH	
L416	1-412-509-11	INDUCTOR 68uH	
L417	1-412-504-11	INDUCTOR 27uH	
L501	1-410-515-11	INDUCTOR 33uH	
L510	1-412-500-11	INDUCTOR 12uH	
L602	1-410-521-11	INDUCTOR 100uH	
L651	1-410-521-11	INDUCTOR 100uH	
L711	1-410-526-11	INDUCTOR 10uH	
L852	1-410-687-11	INDUCTOR 1.2mH	
L853	1-410-687-11	INDUCTOR 1.2mH	
L903	1-412-503-11	INDUCTOR 22uH	
L904	1-410-515-11	INDUCTOR 33uH	
L905	1-412-501-11	INDUCTOR 15uH	
L906	1-410-526-11	INDUCTOR 10uH	
		< TRANSISTOR >	
Q011	8-729-421-19	TRANSISTOR UN2213	
Q012	8-729-421-19	TRANSISTOR UN2213	
Q101	8-729-010-05	TRANSISTOR MSB709-RT1	
Q102	8-729-010-05	TRANSISTOR MSB709-RT1	
Q103	8-729-010-05	TRANSISTOR MSB709-RT1	
Q104	8-729-421-19	TRANSISTOR UN2213	
Q105	8-729-421-19	TRANSISTOR UN2213	
Q107	8-729-421-19	TRANSISTOR UN2213	
Q109	8-729-421-19	TRANSISTOR UN2213	
Q110	8-729-421-19	TRANSISTOR UN2213	
Q111	8-729-010-05	TRANSISTOR MSB709-RT1	
Q112	8-729-010-25	TRANSISTOR MSD601-RT1	
Q113	8-729-010-25	TRANSISTOR MSD601-RT1	
Q116	8-729-421-19	TRANSISTOR UN2213	
Q117	8-729-421-19	TRANSISTOR UN2213	
Q120	8-729-421-19	TRANSISTOR UN2213	
Q121	8-729-421-19	TRANSISTOR UN2213	
Q122	8-729-421-19	TRANSISTOR UN2213	
Q123	8-729-421-19	TRANSISTOR UN2213	
Q127	8-729-421-19	TRANSISTOR UN2213	
Q131	8-729-421-19	TRANSISTOR UN2213	
Q132	8-729-421-19	TRANSISTOR UN2213	
Q133	8-729-421-19	TRANSISTOR UN2213	
Q150	8-729-421-19	TRANSISTOR UN2213	
Q160	8-729-010-25	TRANSISTOR MSD601-RT1	
Q201	8-729-421-19	TRANSISTOR UN2213	
Q202	8-729-010-05	TRANSISTOR MSB709-RT1	
Q301	8-729-010-25	TRANSISTOR MSD601-RT1	
Q302	8-729-010-05	TRANSISTOR MSB709-RT1	
Q303	8-729-010-05	TRANSISTOR MSB709-RT1	
Q304	8-729-010-25	TRANSISTOR MSD601-RT1	
Q401	8-729-010-25	TRANSISTOR MSD601-RT1	
Q402	8-729-010-05	TRANSISTOR MSB709-RT1	
Q405	8-729-421-19	TRANSISTOR UN2213	
Q410	8-729-421-19	TRANSISTOR UN2213	
Q413	8-729-421-19	TRANSISTOR UN2213	
Q414	8-729-421-19	TRANSISTOR UN2213	
Q415	8-729-010-25	TRANSISTOR MSD601-RT1	
Q416	8-729-010-25	TRANSISTOR MSD601-RT1	

Ref. No.	Part No.	Description	Remark
Q418	8-729-010-25	TRANSISTOR MSD601-RT1	
Q419	8-729-421-19	TRANSISTOR UN2213	
Q420	8-729-421-19	TRANSISTOR UN2213	
Q460	8-729-421-19	TRANSISTOR UN2213	
Q503	8-729-421-19	TRANSISTOR UN2213	
Q510	8-729-010-25	TRANSISTOR MSD601-RT1	
Q511	8-729-010-25	TRANSISTOR MSD601-RT1	
Q512	8-729-010-05	TRANSISTOR MSB709-RT1	
Q513	8-729-010-25	TRANSISTOR MSD601-RT1	
Q514	8-729-010-05	TRANSISTOR MSB709-RT1	
Q608	8-729-010-25	TRANSISTOR MSD601-RT1	
Q703	8-729-421-19	TRANSISTOR UN2213	
Q704	8-729-421-19	TRANSISTOR UN2213	
Q707	8-729-901-06	TRANSISTOR DTA144EK	
Q712	8-729-421-19	TRANSISTOR UN2213	
Q713	8-729-421-19	TRANSISTOR UN2213	
Q851	8-729-012-31	TRANSISTOR 2SC4040-TL2-Q	
Q852	8-729-012-31	TRANSISTOR 2SC4040-TL2-Q	
Q853	8-729-421-19	TRANSISTOR UN2213	
Q854	8-729-216-22	TRANSISTOR 2SA1162	
Q855	8-729-216-22	TRANSISTOR 2SA1162	
Q858	8-729-421-19	TRANSISTOR UN2213	
Q859	8-729-421-19	TRANSISTOR UN2213	
Q902	8-729-230-49	TRANSISTOR 2SC2712-G	
Q903	8-729-421-19	TRANSISTOR UN2213	
Q904	8-729-230-49	TRANSISTOR 2SC2712-G	
Q905	8-729-421-19	TRANSISTOR UN2213	
Q908	8-729-010-25	TRANSISTOR MSD601-RT1	
Q909	8-729-421-19	TRANSISTOR UN2213	
Q910	8-729-421-19	TRANSISTOR UN2213	
Q911	8-729-801-46	TRANSISTOR 2SC3064	
Q912	8-729-230-49	TRANSISTOR 2SC2712-G	
Q913	8-729-216-22	TRANSISTOR 2SA1162	
Q914	8-729-806-64	TRANSISTOR 2SA1237F-6B	
Q915	8-729-216-22	TRANSISTOR 2SA1162	
Q916	8-729-230-49	TRANSISTOR 2SC2712-G	
Q917	8-729-424-08	TRANSISTOR UN2111	

< RESISTOR >

R001	1-249-423-11	CARBON	3.3K	5%	1/4W
R005	1-249-429-11	CARBON	10K	5%	1/4W
R006	1-216-073-00	METAL CHIP	10K	5%	1/10W
R011	1-249-419-11	CARBON	1.5K	5%	1/4W
R012	1-249-419-11	CARBON	1.5K	5%	1/4W
R101	1-216-033-00	METAL CHIP	220	5%	1/10W
R102	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R103	1-216-049-00	METAL CHIP	1K	5%	1/10W
R104	1-249-417-11	CARBON	1K	5%	1/4W
R105	1-249-413-11	CARBON	470	5%	1/4W
R106	1-247-818-11	CARBON	300	5%	1/4W
R107	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R108	1-216-045-00	METAL CHIP	680	5%	1/10W
R109	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R110	1-216-041-00	METAL CHIP	470	5%	1/10W
R111	1-216-033-00	METAL CHIP	220	5%	1/10W
R112	1-216-295-00	METAL CHIP	0	5%	1/10W
R113	1-216-073-00	METAL CHIP	10K	5%	1/10W
R114	1-216-049-00	METAL CHIP	1K	5%	1/10W
R116	1-216-046-00	METAL CHIP	750	5%	1/10W
R117	1-216-049-00	METAL CHIP	1K	5%	1/10W
R118	1-216-129-00	METAL CHIP	2.2M	5%	1/10W
R119	1-216-033-00	METAL CHIP	220	5%	1/10W
R121	1-216-036-00	METAL CHIP	300	5%	1/10W
R123	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R124	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R126	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R127	1-249-433-11	CARBON	22K	5%	1/4W
R129	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R131	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R132	1-216-295-00	METAL CHIP	0	5%	1/10W
R134	1-216-064-00	METAL CHIP	4.3K	5%	1/10W
R139	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R141	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R142	1-216-295-00	METAL CHIP	0	5%	1/10W
R143	1-249-423-11	CARBON	3.3K	5%	1/4W
R144	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R145	1-216-049-00	METAL CHIP	1K	5%	1/10W
R146	1-216-033-00	METAL CHIP	220	5%	1/10W
R147	1-216-295-00	METAL CHIP	0	5%	1/10W
R148	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R149	1-216-049-00	METAL CHIP	1K	5%	1/10W
R150	1-216-025-00	METAL CHIP	100	5%	1/10W
R151	1-216-045-00	METAL CHIP	680	5%	1/10W
R152	1-216-043-00	METAL CHIP	560	5%	1/10W
R155	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R156	1-216-041-00	METAL CHIP	470	5%	1/10W
R161	1-216-663-11	METAL CHIP	3.3K	0.5%	1/10W
R162	1-216-295-00	METAL CHIP	0	5%	1/10W
R163	1-216-052-00	METAL CHIP	1.3K	5%	1/10W
R164	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R165	1-216-295-00	METAL CHIP	0	5%	1/10W
R166	1-216-037-00	METAL CHIP	330	5%	1/10W
R167	1-216-295-00	METAL CHIP	0	5%	1/10W
R169	1-216-047-00	METAL CHIP	820	5%	1/10W
R170	1-216-049-00	METAL CHIP	1K	5%	1/10W
R171	1-216-043-00	METAL CHIP	560	5%	1/10W
R172	1-249-423-11	CARBON	3.3K	5%	1/4W
R180	1-249-429-11	CARBON	10K	5%	1/4W

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Ref. No.	Part No.	Description			Remark
R181	1-216-081-00	METAL CHIP	22K	5%	1/10W
R182	1-216-081-00	METAL CHIP	22K	5%	1/10W
R183	1-216-125-00	METAL CHIP	1.5M	5%	1/10W
R184	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R185	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R186	1-216-107-00	METAL CHIP	270K	5%	1/10W
R187	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R189	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R190	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R191	1-216-049-00	METAL CHIP	1K	5%	1/10W
R192	1-249-434-11	CARBON	27K	5%	1/4W
R193	1-216-049-00	METAL CHIP	1K	5%	1/10W
R195	1-216-295-00	METAL CHIP	0	5%	1/10W
R196	1-249-423-11	CARBON	3.3K	5%	1/4W
R198	1-218-768-11	METAL CHIP	470K	0.50%	1/10W
R201	1-216-113-00	METAL CHIP	470K	5%	1/10W
R202	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R203	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R204	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R205	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R206	1-216-049-00	METAL CHIP	1K	5%	1/10W
R207	1-216-029-00	METAL CHIP	150	5%	1/10W
R208	1-216-054-00	METAL GLAZE	1.6K	5%	1/10W
R209	1-216-041-00	METAL CHIP	470	5%	1/10W
R210	1-216-295-00	METAL CHIP	0	5%	1/10W
R211	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R212	1-216-037-00	METAL CHIP	330	5%	1/10W
R213	1-216-295-00	METAL CHIP	0	5%	1/10W
R214	1-216-049-00	METAL CHIP	1K	5%	1/10W
R215	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R216	1-249-409-11	CARBON	220	5%	1/4W
R217	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R218	1-216-049-00	METAL CHIP	1K	5%	1/10W
R301	1-216-079-00	METAL CHIP	18K	5%	1/10W
R302	1-216-073-00	METAL CHIP	10K	5%	1/10W
R303	1-216-033-00	METAL CHIP	220	5%	1/10W
R304	1-216-025-00	METAL CHIP	100	5%	1/10W
R305	1-216-030-00	METAL CHIP	160	5%	1/10W
R306	1-216-121-00	METAL CHIP	1M	5%	1/10W
R307	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R308	1-216-091-00	METAL CHIP	56K	5%	1/10W
R309	1-249-416-11	CARBON	820	5%	1/4W
R310	1-216-035-00	METAL CHIP	270	5%	1/10W
R311	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R401	1-216-062-00	METAL CHIP	3.6K	5%	1/10W
R402	1-216-039-00	METAL CHIP	390	5%	1/10W
R403	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R404	1-249-419-11	CARBON	1.5K	5%	1/4W
R405	1-216-091-00	METAL CHIP	56K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R406	1-216-073-00	METAL CHIP	10K	5%	1/10W
R407	1-216-076-00	METAL CHIP	13K	5%	1/10W
R408	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R409	1-216-049-00	METAL CHIP	1K	5%	1/10W
R410	1-216-073-00	METAL CHIP	10K	5%	1/10W
R411	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R412	1-216-049-00	METAL CHIP	1K	5%	1/10W
R413	1-216-077-00	METAL CHIP	15K	5%	1/10W
R414	1-216-041-00	METAL CHIP	470	5%	1/10W
R415	1-216-043-00	METAL CHIP	560	5%	1/10W
R418	1-216-049-00	METAL CHIP	1K	5%	1/10W
R419	1-249-417-11	CARBON	1K	5%	1/4W
R420	1-216-049-00	METAL CHIP	1K	5%	1/10W
R421	1-216-043-00	METAL CHIP	560	5%	1/10W
R422	1-216-073-00	METAL CHIP	10K	5%	1/10W
R423	1-249-429-11	CARBON	10K	5%	1/4W
R424	1-216-073-00	METAL CHIP	10K	5%	1/10W
R426	1-216-043-00	METAL CHIP	560	5%	1/10W
R427	1-249-418-11	CARBON	1.2K	5%	1/4W
R428	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R429	1-216-024-00	METAL GLAZE	91	5%	1/10W
R430	1-216-043-00	METAL CHIP	560	5%	1/10W
R437	1-216-024-00	METAL GLAZE	91	5%	1/10W
R438	1-216-024-00	METAL GLAZE	91	5%	1/10W
R439	1-216-073-00	METAL CHIP	10K	5%	1/10W
R440	1-249-424-11	CARBON	3.9K	5%	1/4W
R441	1-249-413-11	CARBON	470	5%	1/4W
R442	1-216-041-00	METAL CHIP	470	5%	1/10W
R443	1-216-083-00	METAL CHIP	27K	5%	1/10W
R444	1-216-081-00	METAL CHIP	22K	5%	1/10W
R445	1-216-049-00	METAL CHIP	1K	5%	1/10W
R446	1-216-073-00	METAL CHIP	10K	5%	1/10W
R447	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R448	1-216-109-00	METAL CHIP	330K	5%	1/10W
R449	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R450	1-249-418-11	CARBON	1.2K	5%	1/4W
R451	1-216-049-00	METAL CHIP	1K	5%	1/10W
R452	1-216-049-00	METAL CHIP	1K	5%	1/10W
R453	1-216-081-00	METAL CHIP	22K	5%	1/10W
R454	1-216-077-00	METAL CHIP	15K	5%	1/10W
R455	1-216-045-00	METAL CHIP	680	5%	1/10W
R456	1-216-043-00	METAL CHIP	560	5%	1/10W
R458	1-216-043-00	METAL CHIP	560	5%	1/10W
R460	1-216-073-00	METAL CHIP	10K	5%	1/10W
R461	1-249-417-11	CARBON	1K	5%	1/4W
R465	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R466	1-216-073-00	METAL CHIP	10K	5%	1/10W
R467	1-249-432-11	CARBON	18K	5%	1/4W

Ref. No.	Part No.	Description			Remark
R468	1-249-429-11	CARBON	10K	5%	1/4W
R501	1-249-429-11	CARBON	10K	5%	1/4W
R510	1-216-081-00	METAL CHIP	22K	5%	1/10W
R511	1-216-079-00	METAL CHIP	18K	5%	1/10W
R512	1-216-049-00	METAL CHIP	1K	5%	1/10W
R514	1-216-039-00	METAL CHIP	390	5%	1/10W
R515	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R516	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R517	1-216-041-00	METAL CHIP	470	5%	1/10W
R518	1-216-045-00	METAL CHIP	680	5%	1/10W
R519	1-216-039-00	METAL CHIP	390	5%	1/10W
R520	1-216-045-00	METAL CHIP	680	5%	1/10W
R521	1-216-049-00	METAL CHIP	1K	5%	1/10W
R522	1-216-049-00	METAL CHIP	1K	5%	1/10W
R523	1-216-049-00	METAL CHIP	1K	5%	1/10W
R524	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R525	1-216-025-00	METAL CHIP	100	5%	1/10W
R526	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R603	1-216-121-00	METAL CHIP	1M	5%	1/10W
R604	1-216-101-00	METAL CHIP	150K	5%	1/10W
R607	1-249-433-11	CARBON	22K	5%	1/4W
R608	1-249-426-11	CARBON	5.6K	5%	1/4W
R609	1-216-081-00	METAL CHIP	22K	5%	1/10W
R610	1-216-081-00	METAL CHIP	22K	5%	1/10W
R612	1-216-081-00	METAL CHIP	22K	5%	1/10W
R613	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R614	1-216-101-00	METAL CHIP	150K	5%	1/10W
R615	1-216-121-00	METAL CHIP	1M	5%	1/10W
R617	1-216-045-00	METAL CHIP	680	5%	1/10W
R618	1-216-049-00	METAL CHIP	1K	5%	1/10W
R622	1-216-097-00	METAL CHIP	100K	5%	1/10W
R624	1-216-097-00	METAL CHIP	100K	5%	1/10W
R632	1-216-085-00	METAL CHIP	33K	5%	1/10W
R637	1-216-085-00	METAL CHIP	33K	5%	1/10W
R638	1-249-414-11	CARBON	560	5%	1/4W
R639	1-216-043-00	METAL CHIP	560	5%	1/10W
R640	1-216-043-00	METAL CHIP	560	5%	1/10W
R641	1-249-414-11	CARBON	560	5%	1/4W
R642	1-216-043-00	METAL CHIP	560	5%	1/10W
R643	1-216-043-00	METAL CHIP	560	5%	1/10W
R649	1-216-073-00	METAL CHIP	10K	5%	1/10W
R651	1-216-089-00	METAL CHIP	47K	5%	1/10W
R652	1-216-089-00	METAL CHIP	47K	5%	1/10W
R653	1-216-089-00	METAL CHIP	47K	5%	1/10W
R656	1-216-089-00	METAL CHIP	47K	5%	1/10W
R657	1-216-043-00	METAL CHIP	560	5%	1/10W
R658	1-216-043-00	METAL CHIP	560	5%	1/10W
R659	1-216-043-00	METAL CHIP	560	5%	1/10W
R660	1-216-043-00	METAL CHIP	560	5%	1/10W

Ref. No.	Part No.	Description			Remark
R702	1-216-049-00	METAL CHIP	1K	5%	1/10W
R703	1-216-037-00	METAL CHIP	330	5%	1/10W
R704	1-216-295-00	METAL CHIP	0	5%	1/10W
R705	1-216-295-00	METAL CHIP	0	5%	1/10W
R710	1-216-049-00	METAL CHIP	1K	5%	1/10W
R711	1-249-434-11	CARBON	27K	5%	1/4W
R712	1-216-045-00	METAL CHIP	680	5%	1/10W
R713	1-216-045-00	METAL CHIP	680	5%	1/10W
R716	1-249-393-11	CARBON	10	5%	1/4W
R717	1-249-393-11	CARBON	10	5%	1/4W
R719	1-216-683-11	METAL CHIP	22K	0.5%	1/10W
R750	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R852	1-249-435-11	CARBON	33K	5%	1/4W
R853	1-249-435-11	CARBON	33K	5%	1/4W
R860	1-216-097-00	METAL CHIP	100K	5%	1/10W
R861	1-216-097-00	METAL CHIP	100K	5%	1/10W
R865	1-249-421-11	CARBON	2.2K	5%	1/4W
R866	1-216-001-00	METAL CHIP	10	5%	1/10W
R868	1-216-081-00	METAL CHIP	22K	5%	1/10W
⚠R869	1-249-395-11	CARBON	15	5%	1/4W
R870	1-216-081-00	METAL CHIP	22K	5%	1/10W
⚠R871	1-249-394-11	CARBON	12	5%	1/6W
R872	1-216-073-00	METAL CHIP	10K	5%	1/10W
R873	1-216-081-00	METAL CHIP	22K	5%	1/10W
R874	1-216-081-00	METAL CHIP	22K	5%	1/10W
R875	1-249-435-11	CARBON	33K	5%	1/4W
R876	1-249-435-11	CARBON	33K	5%	1/4W
R877	1-249-429-11	CARBON	10K	5%	1/4W
R880	1-249-429-11	CARBON	10K	5%	1/4W
R902	1-216-075-00	METAL CHIP	12K	5%	1/10W
R903	1-216-073-00	METAL CHIP	10K	5%	1/10W
R906	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R907	1-216-045-00	METAL CHIP	680	5%	1/10W
R909	1-216-049-00	METAL CHIP	1K	5%	1/10W
R910	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R911	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R912	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R913	1-216-049-00	METAL CHIP	1K	5%	1/10W
R915	1-216-041-00	METAL CHIP	470	5%	1/10W
R917	1-216-041-00	METAL CHIP	470	5%	1/10W
R918	1-216-049-00	METAL CHIP	1K	5%	1/10W
R919	1-216-049-00	METAL CHIP	1K	5%	1/10W
R920	1-216-046-00	METAL CHIP	750	5%	1/10W
R921	1-216-041-00	METAL CHIP	470	5%	1/10W
R922	1-216-081-00	METAL CHIP	22K	5%	1/10W
R923	1-216-049-00	METAL CHIP	1K	5%	1/10W
R924	1-216-034-00	METAL CHIP	240	5%	1/10W
R925	1-216-049-00	METAL CHIP	1K	5%	1/10W
R926	1-216-049-00	METAL CHIP	1K	5%	1/10W

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remark
R927	1-249-413-11	CARBON	470	5%	1/4W
R928	1-216-049-00	METAL CHIP	1K	5%	1/10W
R929	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R930	1-216-049-00	METAL CHIP	1K	5%	1/10W
R931	1-216-049-00	METAL CHIP	1K	5%	1/10W
R932	1-216-645-11	METAL CHIP	560	0.5%	1/10W
R933	1-216-645-11	METAL CHIP	560	0.5%	1/10W
R934	1-216-049-00	METAL CHIP	1K	5%	1/10W
R935	1-216-025-00	METAL CHIP	100	5%	1/10W
R936	1-216-045-00	METAL CHIP	680	5%	1/10W
R937	1-216-045-00	METAL CHIP	680	5%	1/10W
R938	1-216-025-00	METAL CHIP	100	5%	1/10W
R939	1-216-049-00	METAL CHIP	1K	5%	1/10W
R940	1-216-043-00	METAL CHIP	560	5%	1/10W
R941	1-216-045-00	METAL CHIP	680	5%	1/10W
R942	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R943	1-216-041-00	METAL CHIP	470	5%	1/10W
R945	1-216-049-00	METAL CHIP	1K	5%	1/10W
R998	1-249-417-11	CARBON	1K	5%	1/4W
R999	1-249-417-11	CARBON	1K	5%	1/4W
		< VARIABLE RESISTOR >			
RV101	1-223-237-11	RES, ADJ, CARBON 2.2K			
RV102	1-223-240-11	RES, ADJ, CARBON 22K			
RV103	1-223-239-11	RES, ADJ, CARBON 10K			
RV104	1-223-240-11	RES, ADJ, CARBON 22K			
RV105	1-223-239-11	RES, ADJ, CARBON 10K			
RV106	1-223-238-11	RES, ADJ, CARBON 4.7K			
RV107	1-223-240-11	RES, ADJ, CARBON 22K			
RV108	1-223-238-11	RES, ADJ, CARBON 4.7K			
RV201	1-223-236-11	RES, ADJ, CARBON 1K			
RV301	1-223-235-11	RES, ADJ, CARBON 470			
RV401	1-223-240-11	RES, ADJ, CARBON 22K			
RV402	1-223-239-11	RES, ADJ, CARBON 10K			
RV403	1-223-242-11	RES, ADJ, CARBON 100K			
RV404	1-223-241-11	RES, ADJ, CARBON 47K			
RV405	1-223-241-11	RES, ADJ, CARBON 47K			
RV406	1-223-235-11	RES, ADJ, CARBON 470			
RV407	1-223-235-11	RES, ADJ, CARBON 470			
RV408	1-223-235-11	RES, ADJ, CARBON 470			
RV851	1-238-550-11	RES, ADJ, CARBON 100K			
		< TRANSFORMER >			
T851	1-423-413-11	TRANSFORMER, BIAS OSCILLATION			
T852	1-423-415-11	TRANSFORMER, BIAS OSCILLATION			
		< VIBRATOR >			
X401	1-577-380-11	VIBRATOR, CRYSTAL (3.58MHz)			

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Ref. No.	Part No.	Description			Remark
*	A-6781-057-A	CB-42 BOARD, COMPLETE			
		**********			
		(Ref. No. 7,000 Series)			
		< CAPACITOR >			
C001	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C004	1-124-126-00	ELECT	47uF	20%	10V
C005	1-165-319-11	CERAMIC CHIP	0.1uF		50V
		< CONNECTOR >			
CN001	1-506-472-11	PIN, CONNECTOR 7P			
		< DIODE >			
D001	8-719-109-93	DIODE RD6.2ES-B2			
D002	8-719-109-93	DIODE RD6.2ES-B2			
D003	8-719-911-19	DIODE 1SS119			
		< IC >			
IC001	8-752-840-28	IC CXP50216-005S			
		< JACK >			
J001	1-691-258-21	JACK (CABLE BOX CONTROL)			
		< COIL >			
L002	1-410-316-11	INDUCTOR 1uH			
		< TRANSISTOR >			
Q001	8-729-010-25	TRANSISTOR MSD601-RT1			
Q002	8-729-140-75	TRANSISTOR 2SD999-CLCK			
Q003	8-729-010-25	TRANSISTOR MSD601-RT1			
Q004	8-729-421-19	TRANSISTOR UN2213			
		< RESISTOR >			
R001	1-216-049-00	METAL CHIP	1K	5%	1/10W
R002	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R003	1-216-049-00	METAL CHIP	1K	5%	1/10W
R004	1-216-089-00	METAL CHIP	47K	5%	1/10W
R005	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R006	1-216-001-00	METAL CHIP	10	5%	1/10W
R007	1-216-049-00	METAL CHIP	1K	5%	1/10W
R008	1-216-049-00	METAL CHIP	1K	5%	1/10W
R009	1-216-049-00	METAL CHIP	1K	5%	1/10W
R010	1-216-049-00	METAL CHIP	1K	5%	1/10W
R011	1-216-049-00	METAL CHIP	1K	5%	1/10W
R012	1-216-049-00	METAL CHIP	1K	5%	1/10W
R013	1-216-049-00	METAL CHIP	1K	5%	1/10W
R014	1-216-049-00	METAL CHIP	1K	5%	1/10W

Ref. No.	Part No.	Description			Remark
		< VIBRATOR >			
X001	1-577-101-11	VIBRATOR, CERAMIC (4.19MHz)			
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*	A-6756-969-A	CF-31 BOARD, COMPLETE			
		**********			
		(Ref. No. 4,000 Series)			
		< CAPACITOR >			
C601	1-124-589-11	ELECT	47uF	20%	16V
C602	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C603	1-126-163-11	ELECT	4.7uF	20%	50V
C604	1-124-589-11	ELECT	47uF	20%	16V
C606	1-124-589-11	ELECT	47uF	20%	16V
C607	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C609	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C610	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C611	1-124-589-11	ELECT	47uF	20%	16V
C612	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C613	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C614	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C615	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C616	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C617	1-124-589-11	ELECT	47uF	20%	16V
C618	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C619	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C620	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C621	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C622	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C623	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C624	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C625	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C626	1-124-589-11	ELECT	47uF	20%	16V
C627	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C628	1-124-589-11	ELECT	47uF	20%	16V
C629	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C630	1-126-163-11	ELECT	4.7uF	20%	50V
C631	1-163-005-11	CERAMIC CHIP	470PF	10%	50V
C632	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C633	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C634	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C640	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C641	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C644	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C646	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C647	1-124-589-11	ELECT	47uF	20%	16V

Ref. No.	Part No.	Description			Remark
		< CONNECTOR >			
CN601	1-573-828-11	CONNECTOR, BOARD TO BOARD 14P			
		< DIODE >			
D601	8-719-400-18	DIODE MA152WK			
		< FERRITE BEAD >			
FB601	1-412-364-11	INDUCTOR CHIP 0UH			
FB602	1-412-364-11	INDUCTOR CHIP 0UH			
FB603	1-412-364-11	INDUCTOR CHIP 0UH			
		< FILTER >			
FL601	1-236-925-11	FILTER, LOW PASS			
FL602	1-236-926-11	FILTER, BAND PASS			
		< IC >			
IC601	8-759-097-80	IC HD49783FP-T1			
IC602	8-759-097-80	IC HD49783FP-T1			
IC605	8-752-334-55	IC CXD1175AM			
IC606	8-752-342-61	IC CXD2105AQ			
		< TRANSISTOR >			
Q601	8-729-120-28	TRANSISTOR	2SC1623-L5L6		
Q602	8-729-216-22	TRANSISTOR	2SA1162		
Q603	8-729-120-28	TRANSISTOR	2SC1623-L5L6		
Q604	8-729-120-28	TRANSISTOR	2SC1623-L5L6		
Q605	8-729-216-22	TRANSISTOR	2SA1162		
Q606	8-729-120-28	TRANSISTOR	2SC1623-L5L6		
Q607	8-729-216-22	TRANSISTOR	2SA1162		
Q609	8-729-216-22	TRANSISTOR	2SA1162		
Q610	8-729-216-22	TRANSISTOR	2SA1162		
Q611	8-729-216-22	TRANSISTOR	2SA1162		
		< RESISTOR >			
R601	1-216-073-00	METAL CHIP	10K	5%	1/10W
R602	1-216-081-00	METAL CHIP	22K	5%	1/10W
R603	1-216-033-00	METAL CHIP	220	5%	1/10W
R604	1-216-041-00	METAL CHIP	470	5%	1/10W
R605	1-216-043-00	METAL CHIP	560	5%	1/10W
R606	1-216-013-00	METAL CHIP	33	5%	1/10W
R607	1-216-041-00	METAL CHIP	470	5%	1/10W
R608	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R609	1-216-025-00	METAL CHIP	100	5%	1/10W
R610	1-216-049-00	METAL CHIP	1K	5%	1/10W
R611	1-216-049-00	METAL CHIP	1K	5%	1/10W
R612	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R613	1-216-049-00	METAL CHIP	1K	5%	1/10W
R614	1-216-049-00	METAL CHIP	1K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R616	1-216-049-00	METAL CHIP	1K	5%	1/10W
R617	1-216-049-00	METAL CHIP	1K	5%	1/10W
R619	1-216-049-00	METAL CHIP	1K	5%	1/10W
R620	1-216-049-00	METAL CHIP	1K	5%	1/10W
R621	1-216-049-00	METAL CHIP	1K	5%	1/10W
R622	1-216-049-00	METAL CHIP	1K	5%	1/10W
R623	1-216-025-00	METAL CHIP	100	5%	1/10W
R624	1-216-033-00	METAL CHIP	220	5%	1/10W
R625	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R626	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R627	1-216-033-00	METAL CHIP	220	5%	1/10W
R628	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R629	1-216-035-00	METAL CHIP	270	5%	1/10W
R630	1-216-081-00	METAL CHIP	22K	5%	1/10W
R631	1-216-081-00	METAL CHIP	22K	5%	1/10W
R633	1-216-081-00	METAL CHIP	22K	5%	1/10W
R634	1-216-081-00	METAL CHIP	22K	5%	1/10W
R635	1-216-073-00	METAL CHIP	10K	5%	1/10W
R641	1-216-121-00	METAL CHIP	1M	5%	1/10W
R646	1-216-041-00	METAL CHIP	470	5%	1/10W

< VARIABLE RESISTOR >

RV601	1-223-238-11	RES, ADJ, CARBON 4.7K
RV602	1-223-238-11	RES, ADJ, CARBON 4.7K

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* A-6721-548-A HF-27 BOARD, COMPLETE

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(Ref. No. 6,000 Series)

< CAPACITOR >

C201	1-123-382-00	ELECT	3.3uF	20%	100V
C202	1-163-006-11	CERAMIC CHIP	560PF	10%	50V
C203	1-124-916-11	ELECT	22uF	20%	63V
C204	1-163-007-11	CERAMIC CHIP	680PF	10%	50V
C205	1-163-006-11	CERAMIC CHIP	560PF	10%	50V
C206	1-137-367-11	FILM	0.0033uF	5%	50V
C207	1-137-370-11	FILM	0.01uF	5%	50V
C208	1-124-126-00	ELECT	47uF	20%	10V
C209	1-137-372-11	FILM	0.022uF	5%	50V
C210	1-124-927-11	ELECT	4.7uF	20%	100V
C211	1-124-907-11	ELECT	10uF	20%	50V
C212	1-124-916-11	ELECT	22uF	20%	63V
C213	1-124-126-00	ELECT	47uF	20%	10V
C214	1-124-903-11	ELECT	1uF	20%	50V
C215	1-124-907-11	ELECT	10uF	20%	50V
C216	1-137-370-11	FILM	0.01uF	5%	50V
C218	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V
C219	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C220	1-163-023-00	CERAMIC CHIP	0.015uF	5%	50V

Ref. No.	Part No.	Description			Remark
C221	1-164-345-11	CERAMIC CHIP	0.082uF	10%	25V
C223	1-123-382-00	ELECT	3.3uF	20%	100V
C224	1-123-382-00	ELECT	3.3uF	20%	100V
C225	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C227	1-137-364-91	FILM	0.001uF	5%	50V
C228	1-124-252-00	ELECT	0.33uF	20%	50V
C229	1-124-443-00	ELECT	100uF	20%	10V
C230	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C231	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C232	1-123-382-00	ELECT	3.3uF	20%	100V
C233	1-163-007-11	CERAMIC CHIP	680PF	10%	50V
C234	1-163-006-11	CERAMIC CHIP	560PF	10%	50V
C235	1-163-006-11	CERAMIC CHIP	560PF	10%	50V
C236	1-137-367-11	FILM	0.0033uF	5%	50V
C237	1-137-370-11	FILM	0.01uF	5%	50V
C238	1-124-126-00	ELECT	47uF	20%	10V
C239	1-137-372-11	FILM	0.022uF	5%	50V
C240	1-124-927-11	ELECT	4.7uF	20%	100V
C241	1-124-907-11	ELECT	10uF	20%	50V
C243	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C244	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C245	1-124-443-00	ELECT	100uF	20%	10V
C246	1-124-034-51	ELECT	33uF	20%	16V
C247	1-124-034-51	ELECT	33uF	20%	16V
C248	1-124-443-00	ELECT	100uF	20%	10V
C249	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C250	1-124-126-00	ELECT	47uF	20%	10V
C251	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C252	1-124-916-11	ELECT	22uF	20%	63V
C253	1-123-382-00	ELECT	3.3uF	20%	100V

< CONNECTOR >

CN201	1-695-938-11	CONNECTOR, BOARD TO BOARD 18P
CN202	1-695-938-11	CONNECTOR, BOARD TO BOARD 18P
CN203	1-695-938-11	CONNECTOR, BOARD TO BOARD 18P

< DIODE >

D201	8-719-404-46	DIODE	MA110
D202	8-719-404-46	DIODE	MA110
D203	8-719-400-18	DIODE	MA152WK
D204	8-719-404-46	DIODE	MA110

< IC >

IC201	8-759-160-54	IC XLH7772KS-VP
IC204	8-759-089-84	IC BA7755AF-T1

< COIL >

L201	1-410-071-11	INDUCTOR 10mH

Ref. No.	Part No.	Description			Remark
		< TRANSISTOR >			
Q201	8-729-808-01	TRANSISTOR	2SD1622-S		
Q202	8-729-018-61	TRANSISTOR	2SB889F		
Q204	8-729-421-19	TRANSISTOR	UN2213		
Q207	8-729-421-19	TRANSISTOR	UN2213		
Q208	8-729-421-19	TRANSISTOR	UN2213		
		< RESISTOR >			
R201	1-216-677-11	METAL CHIP	12K	0.5%	1/10W
R202	1-216-083-00	METAL CHIP	27K	5%	1/10W
R203	1-216-105-00	METAL CHIP	220K	5%	1/10W
R204	1-216-129-00	METAL CHIP	2.2M	5%	1/10W
R205	1-216-049-00	METAL CHIP	1K	5%	1/10W
R206	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R207	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R208	1-216-033-00	METAL CHIP	220	5%	1/10W
R209	1-216-109-00	METAL CHIP	330K	5%	1/10W
R210	1-216-070-00	METAL CHIP	7.5K	5%	1/10W
R211	1-216-037-00	METAL CHIP	330	5%	1/10W
R212	1-216-033-00	METAL CHIP	220	5%	1/10W
R213	1-216-083-00	METAL CHIP	27K	5%	1/10W
R215	1-216-045-00	METAL CHIP	680	5%	1/10W
R216	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R217	1-216-095-00	METAL CHIP	82K	5%	1/10W
R218	1-216-097-00	METAL CHIP	100K	5%	1/10W
R219	1-216-097-00	METAL CHIP	100K	5%	1/10W
R220	1-216-097-00	METAL CHIP	100K	5%	1/10W
R221	1-216-097-00	METAL CHIP	100K	5%	1/10W
R223	1-216-097-00	METAL CHIP	100K	5%	1/10W
R226	1-216-097-00	METAL CHIP	100K	5%	1/10W
R227	1-216-085-00	METAL CHIP	33K	5%	1/10W
R228	1-216-295-00	METAL CHIP	0	5%	1/10W
R229	1-216-073-00	METAL CHIP	10K	5%	1/10W
R230	1-216-073-00	METAL CHIP	10K	5%	1/10W
R231	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R232	1-216-085-00	METAL CHIP	33K	5%	1/10W
R234	1-216-077-00	METAL CHIP	15K	5%	1/10W
R235	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R236	1-216-109-00	METAL CHIP	330K	5%	1/10W
R237	1-216-081-00	METAL CHIP	22K	5%	1/10W
R238	1-216-073-00	METAL CHIP	10K	5%	1/10W
R239	1-216-680-11	METAL CHIP	16K	0.5%	1/10W
R240	1-216-083-00	METAL CHIP	27K	5%	1/10W
R241	1-216-105-00	METAL CHIP	220K	5%	1/10W
R243	1-216-081-00	METAL CHIP	22K	5%	1/10W
R244	1-216-085-00	METAL CHIP	33K	5%	1/10W
R245	1-216-081-00	METAL CHIP	22K	5%	1/10W
R246	1-216-085-00	METAL CHIP	33K	5%	1/10W
R247	1-216-081-00	METAL CHIP	22K	5%	1/10W
R248	1-216-085-00	METAL CHIP	33K	5%	1/10W
R249	1-216-081-00	METAL CHIP	22K	5%	1/10W
R250	1-216-085-00	METAL CHIP	33K	5%	1/10W
R251	1-216-081-00	METAL CHIP	22K	5%	1/10W
R252	1-216-081-00	METAL CHIP	22K	5%	1/10W
R253	1-216-081-00	METAL CHIP	22K	5%	1/10W
R254	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R255	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R261	1-216-129-00	METAL CHIP	2.2M	5%	1/10W
R267	1-216-085-00	METAL CHIP	33K	5%	1/10W
R268	1-216-109-00	METAL CHIP	330K	5%	1/10W
R269	1-216-295-00	METAL CHIP	0	5%	1/10W
R270	1-216-049-00	METAL CHIP	1K	5%	1/10W
R271	1-216-295-00	METAL CHIP	0	5%	1/10W
R297	1-216-099-00	METAL CHIP	120K	5%	1/10W
		< VARIABLE RESISTOR >			
RV202	1-241-763-11	RES, ADJ, CERMET	4.7K		
RV203	1-241-631-11	RES, ADJ, CARBON	22K		
RV204	1-241-764-11	RES, ADJ, CERMET	10K		
RV206	1-241-763-11	RES, ADJ, CERMET	4.7K		
RV207	1-241-631-11	RES, ADJ, CARBON	22K		

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* A-6754-504-A JK-104 BOARD, COMPLETE

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(Ref. No. 2,000 Series)

		< TERMINAL BOARD >			
CJ201	1-750-552-11	TERMINAL BOARD 4P (LINE OUT 1, 3 (VIDEO))			
CJ202	1-750-552-11	TERMINAL BOARD 4P (LINE IN 1, 3 (VIDEO))			
		< CONNECTOR >			
CN211	1-573-828-11	CONNECTOR, BOARD TO BOARD 14P			
CN212	1-573-828-11	CONNECTOR, BOARD TO BOARD 14P			
		< JUMPER RESISTOR >			
JR201	1-216-295-00	METAL CHIP	0	5%	1/10W
JR202	1-216-295-00	METAL CHIP	0	5%	1/10W
JR203	1-216-295-00	METAL CHIP	0	5%	1/10W
JR204	1-216-295-00	METAL CHIP	0	5%	1/10W
JR208	1-216-295-00	METAL CHIP	0	5%	1/10W
		< RESISTOR >			
R201	1-216-097-00	METAL CHIP	100K	5%	1/10W
R202	1-216-097-00	METAL CHIP	100K	5%	1/10W
R203	1-216-097-00	METAL CHIP	100K	5%	1/10W
R204	1-216-097-00	METAL CHIP	100K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R205	1-216-097-00	METAL CHIP	100K	5%	1/10W
R206	1-216-097-00	METAL CHIP	100K	5%	1/10W
R209	1-216-022-00	METAL CHIP	75	5%	1/10W
R210	1-216-022-00	METAL CHIP	75	5%	1/10W
R211	1-216-022-00	METAL CHIP	75	5%	1/10W
R212	1-216-022-00	METAL CHIP	75	5%	1/10W
R213	1-216-022-00	METAL CHIP	75	5%	1/10W
R214	1-216-022-00	METAL CHIP	75	5%	1/10W

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* A-6754-505-A MD-58 BOARD, COMPLETE

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(Ref. No. 6,000 Series)

< CAPACITOR >

C001	1-161-494-00	CERAMIC	0.022uF		25V
C002	1-161-494-00	CERAMIC	0.022uF		25V
C003	1-126-157-11	ELECT	10uF	20%	16V
C004	1-161-379-00	CERAMIC	0.01uF	20%	25V
C006	1-124-589-11	ELECT	47uF	20%	16V
C008	1-164-159-11	CERAMIC	0.1uF		50V
C009	1-164-159-11	CERAMIC	0.1uF		50V
C022	1-161-379-00	CERAMIC	0.01uF	20%	25V
C025	1-162-294-31	CERAMIC	0.001uF	10%	50V
C026	1-162-294-31	CERAMIC	0.001uF	10%	50V

< CONNECTOR >

CN002	1-569-335-11	CONNECTOR, BOARD TO BOARD 9P
CN003	1-569-334-11	CONNECTOR, BOARD TO BOARD 5P
CN004	1-569-341-11	CONNECTOR, BOARD TO BOARD 19P
CN005	1-506-482-11	PIN, CONNECTOR 3P
CN006	1-569-333-11	CONNECTOR, BOARD TO BOARD 3P
CN007	1-569-341-11	CONNECTOR, BOARD TO BOARD 19P
CN009	1-506-484-11	PIN, CONNECTOR 5P

< DIODE >

D001	8-719-985-00	DIODE	GL451VS1
D004	8-719-109-93	DIODE	RD6.2ES-B2
D005	8-719-109-93	DIODE	RD6.2ES-B2
D006	8-719-109-93	DIODE	RD6.2ES-B2
D007	8-719-109-93	DIODE	RD6.2ES-B2

< IC >

IC002	8-759-912-77	IC uPC324C

< PHOTO INTERRUPTER >

PH001	8-759-144-33	IC PS6002
PH002	8-759-144-33	IC PS6002

Ref. No.	Part No.	Description			Remark
		< TRANSISTOR >			
Q001	8-729-926-31	TRANSISTOR	PT483F1S		
Q002	8-729-926-31	TRANSISTOR	PT483F1S		
		< RESISTOR >			
R001	1-249-423-11	CARBON	3.3K	5%	1/4W
R002	1-249-423-11	CARBON	3.3K	5%	1/4W
R003	1-249-426-11	CARBON	5.6K	5%	1/4W
R004	1-249-426-11	CARBON	5.6K	5%	1/4W
R005	1-249-415-11	CARBON	680	5%	1/4W
R006	1-249-441-11	CARBON	100K	5%	1/4W
R007	1-249-441-11	CARBON	100K	5%	1/4W
R008	1-249-425-11	CARBON	4.7K	5%	1/4W
R009	1-249-408-11	CARBON	180	5%	1/4W
R010	1-249-422-11	CARBON	2.7K	5%	1/4W
R011	1-249-437-11	CARBON	47K	5%	1/4W
R012	1-249-421-11	CARBON	2.2K	5%	1/4W
R015	1-249-437-11	CARBON	47K	5%	1/4W
R016	1-249-421-11	CARBON	2.2K	5%	1/4W
R017	1-249-429-11	CARBON	10K	5%	1/4W
R018	1-249-429-11	CARBON	10K	5%	1/4W
R019	1-249-429-11	CARBON	10K	5%	1/4W
R020	1-249-429-11	CARBON	10K	5%	1/4W
R023	1-249-414-11	CARBON	560	5%	1/4W
		< SWITCH >			
S001	1-570-953-11	SWITCH, PUSH (1 KEY)			
S002	1-570-953-11	SWITCH, PUSH (1 KEY)			
S003	1-570-953-11	SWITCH, PUSH (1 KEY)			

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* A-6721-547-A MF-206 BOARD, COMPLETE

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(Ref. No. 8,000 Series)

* 3-947-530-01 HOLDER, TERMINAL, S

< CAPACITOR >

C805	1-163-031-11	CERAMIC CHIP	0.01uF	50V
C806	1-163-035-00	CERAMIC CHIP	0.047uF	50V

< CONNECTOR >

CN801	1-573-826-11	CONNECTOR, BOARD TO BOARD 12P
CN802	1-568-075-11	CONNECTOR (RECEPTALE) 12P
CN803	1-569-336-11	CONNECTOR, BOARD TO BOARD 7P

< DIODE >

D801	8-719-940-82	LED SLR34MC3 (POWER)
D802	8-719-940-82	LED SLR34MC3 (POWER)

Ref. No.	Part No.	Description			Remark
D803	8-719-109-93	DIODE	RD6.2ES-B2		
D804	8-719-109-93	DIODE	RD6.2ES-B2		
D805	8-719-109-93	DIODE	RD6.2ES-B2		
D808	8-719-109-93	DIODE	RD6.2ES-B2		
D811	8-719-911-19	DIODE	1SS119		
D818	8-719-109-93	DIODE	RD6.2ES-B2		
D819	8-719-109-93	DIODE	RD6.2ES-B2		
D824	8-719-109-93	DIODE	RD6.2ES-B2		
		< IC >			
IC801	1-466-833-11	IC RAY-CATCHER BLOCK, REMOCON			
		< JACK >			
J801	1-580-845-11	JACK, PIN 3P (LINE IN 2)			
J803	1-566-850-41	CONNECTOR, (S) TERMINAL 4P (LINE IN 2 (S VIDEO)			
J805	1-568-800-11	JACK, ULTRA SMALL (CONTROL L)			
		< JUMPER RESISTOR >			
JR803	1-216-295-00	METAL CHIP	0	5%	1/10W
		< COIL >			
L801	1-410-316-11	INDUCTOR 1uH			
		< TRANSISTOR >			
Q801	8-729-140-75	TRANSISTOR	2SD999-CLCK		
Q802	8-729-140-75	TRANSISTOR	2SD999-CLCK		
		< RESISTOR >			
R803	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R804	1-216-001-00	METAL CHIP	10	5%	1/10W
R806	1-216-089-00	METAL CHIP	47K	5%	1/10W
R807	1-216-037-00	METAL CHIP	330	5%	1/10W
R808	1-216-022-00	METAL CHIP	75	5%	1/10W
R809	1-216-022-00	METAL CHIP	75	5%	1/10W
R810	1-216-022-00	METAL CHIP	75	5%	1/10W
R811	1-216-295-00	METAL CHIP	0	5%	1/10W
R812	1-216-295-00	METAL CHIP	0	5%	1/10W
R813	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R814	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R817	1-216-658-11	METAL CHIP	2K	0.5%	1/10W
R818	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R819	1-249-429-11	CARBON	10K	5%	1/4W
R820	1-249-417-11	CARBON	1K	5%	1/4W
		< VARIABLE RESISTOR >			
RV802	1-241-906-11	RES, VAR, CARBON 10K (SHARPNESS)			
RV804	1-223-392-11	RES, VAR, CARBON 50K (REC LEVEL)			

Ref. No.	Part No.	Description			Remark
		< SWITCH >			
S801	1-571-977-11	SWITCH, TACTIL (POWER)			
**********					
*	A-6721-546-A	MF-207 BOARD, COMPLETE ********** (Ref. No. 8,000 Series)			
	3-953-510-01	SHEET, INDICATION			
*	3-953-527-01	HOLDER, LCD			
	3-953-532-01	HOLDER, LAMP			
		< CAPACITOR >			
C702	1-124-120-11	ELECT	220uF	20%	25V
C703	1-136-165-00	FILM	0.1uF	5%	50V
⚠C704	1-104-822-11	CERAMIC	47PF	10%	2KV
C707	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C708	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C709	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C710	1-163-031-11	CERAMIC CHIP	0.01uF		50V
		< LAMP >			
⚠CFL701	1-517-176-11	LAMP, COLD CATHODE FLUORESCENT			
		< CONNECTOR >			
CN701	1-568-079-11	CONNECTOR (RECEPTALE) 20P			
CN702	1-569-339-11	CONNECTOR, BOARD TO BOARD 7P			
		< DIODE >			
D701	8-719-911-19	DIODE 1SS119			
D702	8-719-911-19	DIODE 1SS119			
D703	8-719-109-81	DIODE RD4.7ES-B2			
D705	8-719-946-30	LED SLR34DC3 (APC)			
D706	8-719-940-99	LED SLR34VC3 (REC)			
D707	8-719-940-99	LED SLR34VC3 (TIMER REC)			
D708	8-719-946-30	LED SLR34DC3 (SYNCHRO EDIT)			
		< IC >			
IC701	8-759-156-05	IC uPD16430AGF-3B9			
		< JUMPER RESISTOR >			
JR701	1-216-296-00	METAL CHIP	0	5%	1/8W
JR702	1-216-296-00	METAL CHIP	0	5%	1/8W
JR704	1-216-296-00	METAL CHIP	0	5%	1/8W
JR705	1-216-296-00	METAL CHIP	0	5%	1/8W
JR706	1-216-295-00	METAL CHIP	0	5%	1/10W
JR707	1-216-296-00	METAL CHIP	0	5%	1/8W
JR708	1-216-296-00	METAL CHIP	0	5%	1/8W

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remark
JR710	1-216-296-00	METAL CHIP	0	5%	1/8W
JR711	1-216-296-00	METAL CHIP	0	5%	1/8W
		< COIL >			
L702	1-412-543-11	INDUCTOR 330uH			
		< DISPLAY PANEL >			
LC701	1-810-077-11	DISPLAY PANEL, LIQUID CRYSTAL			
		< TRANSISTOR >			
⚠Q701	8-729-140-96	TRANSISTOR KSC1008			
⚠Q702	8-729-140-96	TRANSISTOR KSC1008			
		< RESISTOR >			
R701	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R702	1-216-649-11	METAL CHIP	820	0.5%	1/10W
R703	1-216-085-00	METAL CHIP	33K	5%	1/10W
R704	1-216-097-00	METAL CHIP	100K	5%	1/10W
R705	1-216-295-00	METAL CHIP	0	5%	1/10W
R706	1-216-295-00	METAL CHIP	0	5%	1/10W
R707	1-216-295-00	METAL CHIP	0	5%	1/10W
R708	1-216-073-00	METAL CHIP	10K	5%	1/10W
R709	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R710	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R711	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R712	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R713	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R715	1-216-073-00	METAL CHIP	10K	5%	1/10W
R720	1-216-073-00	METAL CHIP	10K	5%	1/10W
R721	1-216-073-00	METAL CHIP	10K	5%	1/10W
R722	1-216-073-00	METAL CHIP	10K	5%	1/10W
R723	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R724	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
		< SWITCH >			
S701	1-571-977-11	SWITCH, TACTIL (CL)			
S702	1-572-561-11	SWITCH, SLIDE (COMMAND MODE)			
S703	1-572-907-11	SWITCH, SLIDE (BACK LIGHT)			
S704	1-572-908-11	SWITCH, SLIDE (S VHS)			
S705	1-571-300-21	SWITCH, ROTARY (CLOSE)			
S706	1-571-977-11	SWITCH, TACTIL (APC)			
		< TRANSFORMER >			
⚠T701	1-423-654-11	TRANSFORMER, DC-AC CONVERTER			

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Ref. No.	Part No.	Description			Remark
*	A-6727-484-A	RP-158 BOARD, COMPLETE			
		**********			
		(Ref. No. 1,000 Series)			
		< CAPACITOR >			
C100	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C103	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C104	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C105	1-163-245-11	CERAMIC CHIP	56PF	5%	50V
C106	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C107	1-126-157-11	ELECT	10uF	20%	16V
C108	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C120	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C260	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C261	1-124-584-00	ELECT	100uF	20%	10V
C262	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C263	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C264	1-124-257-00	ELECT	2.2uF	20%	50V
C265	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C267	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C270	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C271	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C272	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C273	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C274	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C275	1-126-160-11	ELECT	1uF	20%	50V
C276	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C277	1-124-589-11	ELECT	47uF	20%	16V
C278	1-163-234-11	CERAMIC CHIP	20PF	5%	50V
C801	1-163-033-00	CERAMIC CHIP	0.022uF		50V
C802	1-163-033-00	CERAMIC CHIP	0.022uF		50V
C803	1-163-033-00	CERAMIC CHIP	0.022uF		50V
C804	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C805	1-163-033-00	CERAMIC CHIP	0.022uF		50V
C806	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C807	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C808	1-124-584-00	ELECT	100uF	20%	10V
C809	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C810	1-124-584-00	ELECT	100uF	20%	10V
C811	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C813	1-124-252-00	ELECT	0.33uF	20%	50V
C814	1-164-159-11	CERAMIC	0.1uF		50V
C815	1-164-159-11	CERAMIC	0.1uF		50V
C816	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C817	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C818	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C821	1-163-234-11	CERAMIC CHIP	20PF	5%	50V
C822	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C823	1-163-031-11	CERAMIC CHIP	0.01uF		50V

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Ref. No.	Part No.	Description			Remark
C824	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C826	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C827	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C828	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C829	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C830	1-163-025-11	CERAMIC CHIP	0.001uF		50V
C834	1-163-222-11	CERAMIC CHIP	5PF	0.25PF	50V
C837	1-124-589-11	ELECT	47uF	20%	16V
C838	1-124-589-11	ELECT	47uF	20%	16V
C840	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C841	1-124-589-11	ELECT	47uF	20%	16V
C851	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C853	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C856	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C859	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C871	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C872	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C881	1-163-087-00	CERAMIC CHIP	4PF		50V
C882	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C883	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C884	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C885	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C886	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C887	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C888	1-163-085-00	CERAMIC CHIP	2PF		50V
C889	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C890	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C891	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C892	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C893	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C895	1-163-038-00	CERAMIC CHIP	0.1uF		25V

< CONNECTOR >

CN801	1-569-930-11	HOUSING, CONNECTOR 13P	
CN802	1-569-338-11	CONNECTOR, BOARD TO BOARD 19P	
* CN803	1-564-029-00	PIN, CONNECTOR 4P	
CN805	1-569-338-11	CONNECTOR, BOARD TO BOARD 19P	

< DIODE >

D271	8-719-104-34	DIODE	1S2836
D801	8-719-911-19	DIODE	1SS119
D802	8-719-911-19	DIODE	1SS119
D803	8-719-911-19	DIODE	1SS119
D805	8-719-911-19	DIODE	1SS119
D806	8-719-911-19	DIODE	1SS119
D807	8-719-911-19	DIODE	1SS119
D808	8-719-911-19	DIODE	1SS119
D809	8-719-911-19	DIODE	1SS119
D810	8-719-911-19	DIODE	1SS119
D811	8-719-911-19	DIODE	1SS119
D813	8-719-911-19	DIODE	1SS119

< IC >

IC260	8-759-055-49	IC AN3327K
IC801	8-759-046-75	IC HA118162NT
IC802	8-759-097-80	IC HD49783FP-T1

< COIL >

L100	1-412-498-11	INDUCTOR 6.8uH
L101	1-410-521-11	INDUCTOR 100uH
L260	1-410-521-11	INDUCTOR 100uH
L271	1-410-521-11	INDUCTOR 100uH
L272	1-412-507-11	INDUCTOR 47uH
L801	1-412-514-11	INDUCTOR 220uH
L802	1-412-514-11	INDUCTOR 220uH
L803	1-410-521-11	INDUCTOR 100uH
L804	1-410-521-11	INDUCTOR 100uH
L810	1-412-513-11	INDUCTOR 180uH
L811	1-410-521-11	INDUCTOR 100uH
L812	1-410-521-11	INDUCTOR 100uH
L813	1-412-508-11	INDUCTOR 56uH
L821	1-408-429-00	INDUCTOR 470uH
L850	1-412-501-11	INDUCTOR 15uH
L851	1-410-526-11	INDUCTOR 10uH
L852	1-412-507-11	INDUCTOR 47uH
L854	1-410-526-11	INDUCTOR 10uH
L855	1-410-526-11	INDUCTOR 10uH
L890	1-410-526-11	INDUCTOR 10uH
L891	1-410-526-11	INDUCTOR 10uH

< TRANSISTOR >

Q100	8-729-216-22	TRANSISTOR	2SA1162
Q101	8-729-216-22	TRANSISTOR	2SA1162
Q102	8-729-421-19	TRANSISTOR	UN2213
Q271	8-729-010-05	TRANSISTOR	MSB709-RT1
Q272	8-729-421-19	TRANSISTOR	UN2213
Q802	8-729-010-25	TRANSISTOR	MSD601-RT1
Q803	8-729-901-06	TRANSISTOR	DTA144EK
Q804	8-729-230-49	TRANSISTOR	2SC2712-G
Q805	8-729-216-22	TRANSISTOR	2SA1162
Q810	8-729-421-19	TRANSISTOR	UN2213
Q811	8-729-301-98	TRANSISTOR	2SB1000A-L
Q813	8-729-901-06	TRANSISTOR	DTA144EK
Q814	8-729-421-19	TRANSISTOR	UN2213
Q821	8-729-230-49	TRANSISTOR	2SC2712-G
Q822	8-729-230-49	TRANSISTOR	2SC2712-G
Q823	8-729-230-49	TRANSISTOR	2SC2712-G

Ref. No.	Part No.	Description				Remark
Q825	8-729-421-19	TRANSISTOR	UN2213			
Q828	8-729-230-49	TRANSISTOR	2SC2712-G			
Q830	8-729-230-49	TRANSISTOR	2SC2712-G			
Q833	8-729-010-25	TRANSISTOR	MSD601-RT1			
Q835	8-729-010-25	TRANSISTOR	MSD601-RT1			
Q845	8-729-216-22	TRANSISTOR	2SA1162			
Q846	8-729-216-22	TRANSISTOR	2SA1162			
Q847	8-729-901-06	TRANSISTOR	DTA144EK			
Q848	8-729-421-19	TRANSISTOR	UN2213			
Q850	8-729-421-19	TRANSISTOR	UN2213			
Q851	8-729-216-22	TRANSISTOR	2SA1162			
Q853	8-729-424-08	TRANSISTOR	UN2111			
Q854	8-729-424-73	TRANSISTOR	UN2219-TX			
Q855	8-729-424-73	TRANSISTOR	UN2219-TX			
Q881	8-729-421-19	TRANSISTOR	UN2213			
Q882	8-729-421-19	TRANSISTOR	UN2213			
Q890	8-729-010-25	TRANSISTOR	MSD601-RT1			
Q891	8-729-010-25	TRANSISTOR	MSD601-RT1			
		< RESISTOR >				
R101	1-216-025-00	METAL CHIP	100	5%	1/10W	
R104	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R105	1-216-045-00	METAL CHIP	680	5%	1/10W	
R106	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R107	1-216-093-00	METAL CHIP	68K	5%	1/10W	
R108	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	
R120	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R121	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R262	1-216-035-00	METAL CHIP	270	5%	1/10W	
R263	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R265	1-216-033-00	METAL CHIP	220	5%	1/10W	
R266	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R267	1-216-035-00	METAL CHIP	270	5%	1/10W	
R271	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R272	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R273	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R274	1-216-067-00	METAL CHIP	5.6K	5%	1/10W	
R276	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R801	1-216-025-00	METAL CHIP	100	5%	1/10W	
R802	1-216-039-00	METAL CHIP	390	5%	1/10W	
R806	1-216-025-00	METAL CHIP	100	5%	1/10W	
R807	1-216-025-00	METAL CHIP	100	5%	1/10W	
R808	1-216-023-00	METAL CHIP	82	5%	1/10W	
R809	1-216-017-00	METAL CHIP	47	5%	1/10W	
R810	1-249-419-11	CARBON	1.5K	5%	1/4W	
R811	1-216-039-00	METAL CHIP	390	5%	1/10W	
R812	1-216-025-00	METAL CHIP	100	5%	1/10W	
R813	1-216-041-00	METAL CHIP	470	5%	1/10W	
R815	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R816	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R817	1-249-417-11	CARBON	1K	5%	1/4W	

Ref. No.	Part No.	Description				Remark
R818	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R821	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R822	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R823	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R824	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R825	1-216-295-00	METAL CHIP	0	5%	1/10W	
R826	1-216-295-00	METAL CHIP	0	5%	1/10W	
R827	1-216-295-00	METAL CHIP	0	5%	1/10W	
R828	1-216-295-00	METAL CHIP	0	5%	1/10W	
R829	1-216-043-00	METAL CHIP	560	5%	1/10W	
R830	1-216-043-00	METAL CHIP	560	5%	1/10W	
R831	1-216-046-00	METAL CHIP	750	5%	1/10W	
R832	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R834	1-249-426-11	CARBON	5.6K	5%	1/4W	
R835	1-216-042-00	METAL CHIP	510	5%	1/10W	
R838	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R839	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R850	1-216-025-00	METAL CHIP	100	5%	1/10W	
R851	1-216-309-00	METAL CHIP	5.6	5%	1/10W	
R860	1-249-417-11	CARBON	1K	5%	1/4W	
R861	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R862	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R863	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R864	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R865	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R866	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R867	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R868	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R869	1-249-417-11	CARBON	1K	5%	1/4W	
R870	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R872	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R873	1-216-037-00	METAL CHIP	330	5%	1/10W	
R876	1-216-606-11	METAL CHIP	13	0.50%	1/10W	
R877	1-249-419-11	CARBON	1.5K	5%	1/4W	
R878	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R879	1-216-047-00	METAL CHIP	820	5%	1/10W	
R880	1-216-033-00	METAL CHIP	220	5%	1/10W	
R881	1-249-421-11	CARBON	2.2K	5%	1/4W	
R882	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R883	1-216-198-00	METAL CHIP	1K	5%	1/8W	
R885	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R886	1-216-047-00	METAL CHIP	820	5%	1/10W	
R887	1-216-044-00	METAL CHIP	620	5%	1/10W	
R889	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R890	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R891	1-216-075-00	METAL CHIP	12K	5%	1/10W	
R892	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R897	1-216-041-00	METAL CHIP	470	5%	1/10W	
R898	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R899	1-216-073-00	METAL CHIP	10K	5%	1/10W	

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Ref. No.	Part No.	Description		Remark
⚠	1-413-825-11	SR-460 BOARD, COMPLETE		
		**********		
		(Ref. No. 9,000 Series)		
	9-902-089-01	SCREW M3X8		
	9-902-059-01	CLIP, FUSE		
⚠	9-902-089-01	INLET, AC		
		< CAPASITOR >		
⚠C101	9-900-521-01	FILM	0.1uF	125V
⚠C102	9-900-521-01	FILM	0.1uF	125V
⚠C103	9-904-183-01	CERAMIC	1000PF	125V
⚠C104	9-904-183-01	CERAMIC	1000PF	125V
⚠C105	9-900-522-01	CERAMIC	2200PF	125V
⚠C106	9-902-523-01	ELECT	220uF	200V
C107	9-900-525-01	FILM	0.047uF	400V
C108	9-902-055-01	CERAMIC	100PF	1KV
C109	9-904-718-01	ELECT	4,7uF	50V
C110	1-130-495-51	FILM	0.1uF	50V
C111	1-130-491-51	FILM	0.047uF	50V
C112	1-130-491-51	FILM	0.047uF	50V
C201	9-904-724-01	ELECT	100uF	50V
C204	9-904-726-01	ELECT	2200uF	16V
C205	9-904-727-01	ELECT	220uF	16V
C206	9-904-728-01	ELECT	3300uF	10V
C207	1-126-960-51	ELECT	1uF	50V
C208	9-904-729-01	ELECT	470uF	10V
C209	9-904-727-01	ELECT	220uF	16V
		< CONNECTOR >		
CN001	1-568-787-11	CONNECTOR 10P		
CN002	1-568-782-11	CONNECTOR 5P		
CN1	9-903-934-01	CONNECTOR ASSY, 2P		
		< DIODE >		
⚠D101	9-904-714-01	DIODE	LB-156	
⚠D102	9-902-050-01	DIODE	ERA15-06	
⚠D103	9-900-512-01	DIODE	AG01A	
⚠D104	8-719-920-32	DIODE	ERA15-02	
⚠D105	9-902-757-01	DIODE	MA4030	
⚠D106	9-900-514-01	DIODE	MA165	
⚠D107	9-902-757-01	DIODE	MA4030	
⚠D201	9-900-535-01	DIODE	AU02Z	
⚠D203	9-904-722-01	DIODE	D4L20U	
⚠D204	9-903-932-02	DIODE	MA2150	
⚠D205	9-904-723-01	DIODE	D5S4M	
⚠D206	8-719-920-32	DIODE	ERA15-02	
⚠D207	8-719-920-32	DIODE	ERA15-02	
⚠D208	9-900-535-01	DIODE	AU02Z	

Ref. No.	Part No.	Description		Remark
		< FERRITE BEAD >		
⚠FB-1	9-903-929-01	CORE, BEAD		
		< FUSE >		
⚠F101	1-533-296-11	FUSE 125V 2A		
		< IC >		
⚠IC201	9-900-532-01	IC AN1431T		
		< COIL >		
⚠L101	9-904-717-01	FILTER, LINE		
⚠L201	9-904-731-01	COIL, CHOKE 10uH		
⚠L202	9-904-731-01	COIL, CHOKE 10uH		
		< PHOTO COUPLER >		
⚠PC101	9-900-519-01	PHOTO COUPLER ON3131		
		< TRANSISTOR >		
⚠Q101	9-904-715-01	TRANSISTOR 2SC4056		
⚠Q102	9-900-517-01	TRANSISTOR 2SC3377		
⚠Q103	9-900-517-01	TRANSISTOR 2SC3377		
		< IC LINK >		
⚠PS201	1-532-637-11	IC LINK ICP-N25 (50V 1A)		
		< RESISTOR >		
⚠R101	1-202-917-51	SOLID	6.8M	1/2W
R102	1-247-879-31	CARBON	100K	1/4W
R103	1-247-879-31	CARBON	100K	1/4W
R104	1-247-863-31	CARBON	22K	1/4W
R105	9-904-719-01	METAL OXIDE FILM	22K	3W
R106	9-904-720-01	METAL OXIDE FILM	47	1W
R107	9-904-720-01	METAL OXIDE FILM	47	1W
R108	1-247-831-31	CARBON	1K	1/4W
R109	9-904-721-01	CARBON	750	1/4W
⚠R201	1-247-727-11	CARBON	10	1/2W F
⚠R202	1-244-841-11	CARBON	47	1/2W
R203	1-215-428-31	METAL	2K	1/4W
R205	1-215-425-31	METAL	1.5K	1/4W
		< TRANSFORMER >		
⚠T101	9-904-906-01	TRANSFORMER, SWITCHING		
		< VARIABLE RESISTOR >		
VR201	9-902-761-01	RES, ADJ, 200		

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

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Ref. No.	Part No.	Description			Remark
*	A-6782-056-A	ST-49 BOARD, COMPLETE			
		**********			
		(Ref. No. 5,000 Series)			
*	3-741-933-01	HEAT SINK			
	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3			
	7-685-646-81	SCREW +BVTP 3X8 TYPE2			
		< BUZZER >			
BZ401	1-529-080-11	BUZZER, PIEZOELECTRIC			
		< CAPACITOR >			
C301	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C302	1-124-126-00	ELECT	47uF	20%	10V
C303	1-164-344-11	CERAMIC CHIP	0.068uF	10%	25V
C304	1-124-916-11	ELECT	22uF	20%	63V
C305	1-124-443-00	ELECT	100uF	20%	10V
C306	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C307	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C308	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C309	1-124-925-11	ELECT	2.2uF	20%	100V
C310	1-124-126-00	ELECT	47uF	20%	10V
C311	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C312	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C313	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C314	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C315	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C316	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C317	1-124-925-11	ELECT	2.2uF	20%	100V
C318	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C319	1-124-126-00	ELECT	47uF	20%	10V
C320	1-163-101-00	CERAMIC CHIP	22PF	5%	50V
C358	1-124-925-11	ELECT	2.2uF	20%	100V
C401	1-124-360-00	ELECT	1000uF	20%	16V
C404	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C405	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C406	1-125-705-11	CAP, DOUBLE LAYERS	0.22F		
C407	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C408	1-124-442-00	ELECT	330uF	20%	6.3V
C409	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C410	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C411	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C413	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C414	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C420	1-124-903-11	ELECT	1uF	20%	50V
C421	1-124-903-11	ELECT	1uF	20%	50V
C423	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C424	1-124-126-00	ELECT	47uF	20%	10V

Ref. No.	Part No.	Description			Remark
C501	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C503	1-126-101-11	ELECT	100uF	20%	16V
C504	1-130-489-00	MYLAR	0.033uF	5%	50V
C505	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C507	1-130-485-00	MYLAR	0.015uF	5%	50V
C508	1-124-925-11	ELECT	2.2uF	20%	100V
C509	1-164-096-11	CERAMIC	0.01uF		50V
C510	1-124-443-00	ELECT	100uF	20%	10V
C511	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C512	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C513	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C514	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C515	1-161-061-11	CERAMIC	0.068uF	10%	50V
C516	1-126-176-11	ELECT	220uF	20%	10V
C704	1-124-916-11	ELECT	22uF	20%	63V
C709	1-126-101-11	ELECT	100uF	20%	16V
C710	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C711	1-124-927-11	ELECT	4.7uF	20%	100V
C712	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C714	1-124-126-00	ELECT	47uF	20%	10V
C717	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C720	1-124-126-00	ELECT	47uF	20%	10V
C724	1-124-907-11	ELECT	10uF	20%	50V
C725	1-124-907-11	ELECT	10uF	20%	50V
C726	1-124-907-11	ELECT	10uF	20%	50V
C728	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V
C729	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V
C730	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V
		< CONNECTOR >			
CN401	1-691-702-11	CONNECTOR, BOARD TO BOARD 20P			
CN402	1-506-475-11	PIN, CONNECTOR 10P			
CN403	1-506-472-11	PIN, CONNECTOR 7P			
CN501	1-750-554-11	CONNECTOR, BOARD TO BOARD 19P			
CN502	1-750-554-11	CONNECTOR, BOARD TO BOARD 19P			
* CN503	1-560-891-00	PIN, CONNECTOR 3P			
CN504	1-506-475-11	PIN, CONNECTOR 10P			
* CN505	1-563-632-11	CONNECTOR, FLEXIBLE 29P			
CN506	1-569-341-11	CONNECTOR, BOARD TO BOARD 19P			
* CN507	1-560-891-00	PIN, CONNECTOR 3P			
CN508	1-569-341-11	CONNECTOR, BOARD TO BOARD 19P			
* CN510	1-564-028-00	PIN, CONNECTOR 3P			
		< TRIMMER >			
CT412	1-141-227-00	CAP, TRIMMER 20PF			

Ref. No.	Part No.	Description			Remark
		< DIODE >			
⚠D302	8-719-200-76	DIODE 10E1N			
D306	8-719-911-19	DIODE 1SS119			
D307	8-719-911-19	DIODE 1SS119			
D351	8-719-109-93	DIODE RD6.2ES-B2			
D355	8-719-911-19	DIODE 1SS119			
D356	8-719-911-19	DIODE 1SS119			
D401	8-719-911-19	DIODE 1SS119			
D402	8-719-911-19	DIODE 1SS119			
D403	8-719-200-82	DIODE 11ES2			
D404	8-719-911-19	DIODE 1SS119			
D406	8-719-911-19	DIODE 1SS119			
D407	8-719-911-19	DIODE 1SS119			
D501	8-719-911-19	DIODE 1SS119			
D502	8-719-982-09	DIODE MTZJ-T-72-4.3			
D503	8-719-921-37	DIODE MTZJ-4.7			
D504	8-719-200-82	DIODE 11ES2			
D506	8-719-911-19	DIODE 1SS119			
⚠D701	8-719-929-71	DIODE HZS33NB1			
D702	8-719-911-19	DIODE 1SS119			
D703	8-719-911-19	DIODE 1SS119			
		< IC >			
IC301	8-759-246-14	IC TA8823N			
IC401	8-759-156-10	IC MB89095-128			
IC402	8-759-502-00	IC ST93CS56B1			
IC403	8-759-520-98	IC PST572K			
IC404	8-759-510-43	IC PST572C			
⚠IC501	8-759-983-45	IC BA6238A			
IC502	8-759-981-48	IC RC082M2G2			
IC503	8-752-843-09	IC CXP80732-004Q			
		< JACK >			
J301	1-507-562-00	JACK			
		< JUMPER RESISTOR >			
JR001	1-216-296-00	METAL CHIP	0	5%	1/8W
JR002	1-216-296-00	METAL CHIP	0	5%	1/8W
JR003	1-216-296-00	METAL CHIP	0	5%	1/8W
JR004	1-216-296-00	METAL CHIP	0	5%	1/8W
JR005	1-216-296-00	METAL CHIP	0	5%	1/8W
JR006	1-216-296-00	METAL CHIP	0	5%	1/8W
JR007	1-216-033-00	METAL CHIP	220	5%	1/10W
JR009	1-216-296-00	METAL CHIP	0	5%	1/8W
JR010	1-216-296-00	METAL CHIP	0	5%	1/8W
JR011	1-216-296-00	METAL CHIP	0	5%	1/8W
JR012	1-216-296-00	METAL CHIP	0	5%	1/8W
JR014	1-216-295-00	METAL CHIP	0	5%	1/10W

Ref. No.	Part No.	Description			Remark
JR015	1-216-296-00	METAL CHIP	0	5%	1/8W
JR017	1-216-296-00	METAL CHIP	0	5%	1/8W
JR018	1-216-296-00	METAL CHIP	0	5%	1/8W
JR022	1-216-296-00	METAL CHIP	0	5%	1/8W
JR023	1-216-296-00	METAL CHIP	0	5%	1/8W
JR024	1-216-296-00	METAL CHIP	0	5%	1/8W
JR025	1-216-295-00	METAL CHIP	0	5%	1/10W
JR026	1-216-295-00	METAL CHIP	0	5%	1/10W
JR028	1-216-296-00	METAL CHIP	0	5%	1/8W
JR030	1-216-296-00	METAL CHIP	0	5%	1/8W
JR100	1-216-295-00	METAL CHIP	0	5%	1/10W
		< RESISTOR >			
JW032	1-249-405-11	CARBON	100	5%	1/4W
		< COIL >			
JW039	1-410-509-11	INDUCTOR 10uH			
JW049	1-412-488-11	INDUCTOR 1UH			
JW050	1-412-488-11	INDUCTOR 1UH			
		< RESISTOR >			
JW052	1-249-405-11	CARBON	100	5%	1/4W
JW406	1-249-405-11	CARBON	100	5%	1/4W
JW407	1-249-405-11	CARBON	100	5%	1/4W
JW412	1-249-405-11	CARBON	100	5%	1/4W
JW413	1-249-405-11	CARBON	100	5%	1/4W
JW414	1-249-405-11	CARBON	100	5%	1/4W
JW416	1-249-409-11	CARBON	220	5%	1/4W
JW417	1-249-409-11	CARBON	220	5%	1/4W
		< COIL >			
JW418	1-412-488-11	INDUCTOR 1UH			
JW419	1-412-488-11	INDUCTOR 1UH			
JW420	1-412-488-11	INDUCTOR 1UH			
		< RESISTOR >			
JW421	1-249-413-11	CARBON	470	5%	1/4W
JW422	1-249-413-11	CARBON	470	5%	1/4W
JW423	1-249-413-11	CARBON	470	5%	1/4W
JW424	1-249-413-11	CARBON	470	5%	1/4W
JW425	1-249-413-11	CARBON	470	5%	1/4W
JW427	1-249-409-11	CARBON	220	5%	1/4W
JW428	1-249-409-11	CARBON	220	5%	1/4W
JW429	1-249-409-11	CARBON	220	5%	1/4W
JW430	1-249-405-11	CARBON	100	5%	1/4W
JW436	1-249-409-11	CARBON	220	5%	1/4W

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

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Ref. No.	Part No.	Description	Remark
		< COIL >	
L301	1-410-512-11	INDUCTOR 18uH	
L302	1-410-521-11	INDUCTOR 100uH	
L303	1-410-519-11	INDUCTOR 68uH	
L401	1-414-177-11	INDUCTOR 1uH	
L403	1-410-521-11	INDUCTOR 100uH	
L404	1-410-509-11	INDUCTOR 10uH	
L450	1-410-316-11	INDUCTOR 1uH	
L502	1-410-501-11	INDUCTOR 2.2uH	
L701	1-410-509-11	INDUCTOR 10uH	
L702	1-410-509-11	INDUCTOR 10uH	
L704	1-410-509-11	INDUCTOR 10uH	
L706	1-410-509-11	INDUCTOR 10uH	
		< IC LINK >	
⚠PS501	1-532-685-00	LINK, IC	
		< TRANSISTOR >	
Q301	8-729-010-25	TRANSISTOR MSD601-RT1	
Q302	8-729-421-19	TRANSISTOR UN2213	
Q303	8-729-010-25	TRANSISTOR MSD601-RT1	
Q304	8-729-901-06	TRANSISTOR DTA144EK	
Q305	8-729-010-25	TRANSISTOR MSD601-RT1	
Q307	8-729-010-05	TRANSISTOR MSB709-RT1	
Q351	8-729-901-06	TRANSISTOR DTA144EK	
Q352	8-729-421-19	TRANSISTOR UN2213	
Q401	8-729-141-83	TRANSISTOR 2SA473	
Q402	8-729-010-25	TRANSISTOR MSD601-RT1	
Q407	8-729-901-06	TRANSISTOR DTA144EK	
Q408	8-729-901-06	TRANSISTOR DTA144EK	
Q409	8-729-901-06	TRANSISTOR DTA144EK	
Q410	8-729-901-06	TRANSISTOR DTA144EK	
Q411	8-729-421-19	TRANSISTOR UN2213	
Q412	8-729-421-19	TRANSISTOR UN2213	
Q501	8-729-424-56	TRANSISTOR UN211L	
Q502	8-729-424-08	TRANSISTOR UN2111	
Q598	8-729-421-19	TRANSISTOR UN2213	
Q599	8-729-421-19	TRANSISTOR UN2213	
⚠Q701	8-729-422-36	TRANSISTOR 2SB709A-Q	
Q703	8-729-010-25	TRANSISTOR MSD601-RT1	
Q704	8-729-022-91	TRANSISTOR UN2212AI-(TX)	
Q706	8-729-010-05	TRANSISTOR MSB709-RT1	
Q711	8-729-010-25	TRANSISTOR MSD601-RT1	
		< RESISTOR >	
R301	1-216-119-00	METAL CHIP 820K 5%	1/10W
R302	1-249-439-11	CARBON 68K 5%	1/4W
R303	1-216-097-00	METAL CHIP 100K 5%	1/10W
R304	1-216-097-00	METAL CHIP 100K 5%	1/10W
R305	1-216-085-00	METAL CHIP 33K 5%	1/10W
R306	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R307	1-216-037-00	METAL CHIP 330 5%	1/10W
R308	1-216-025-00	METAL CHIP 100 5%	1/10W
R309	1-216-659-11	METAL CHIP 2.2K 0.5%	1/10W
R310	1-216-651-11	METAL CHIP 1K 0.5%	1/10W
R311	1-216-081-00	METAL CHIP 22K 5%	1/10W
R312	1-216-079-00	METAL CHIP 18K 5%	1/10W
R313	1-216-039-00	METAL CHIP 390 5%	1/10W
R314	1-216-053-00	METAL CHIP 1.5K 5%	1/10W
R315	1-216-035-00	METAL CHIP 270 5%	1/10W
R316	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R317	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R318	1-216-049-00	METAL CHIP 1K 5%	1/10W
R319	1-216-073-00	METAL CHIP 10K 5%	1/10W
R320	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R321	1-216-041-00	METAL CHIP 470 5%	1/10W
R322	1-216-033-00	METAL CHIP 220 5%	1/10W
R323	1-216-053-00	METAL CHIP 1.5K 5%	1/10W
R324	1-216-073-00	METAL CHIP 10K 5%	1/10W
R326	1-216-659-11	METAL CHIP 2.2K 0.5%	1/10W
R367	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R401	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R402	1-216-063-00	METAL CHIP 3.9K 5%	1/10W
R403	1-216-089-00	METAL CHIP 47K 5%	1/10W
R404	1-216-055-00	METAL CHIP 1.8K 5%	1/10W
R405	1-216-095-00	METAL CHIP 82K 5%	1/10W
R407	1-216-113-00	METAL CHIP 470K 5%	1/10W
R408	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R409	1-216-049-00	METAL CHIP 1K 5%	1/10W
R410	1-216-049-00	METAL CHIP 1K 5%	1/10W
R415	1-216-029-00	METAL CHIP 150 5%	1/10W
R416	1-216-037-00	METAL CHIP 330 5%	1/10W
R417	1-216-037-00	METAL CHIP 330 5%	1/10W
R418	1-216-029-00	METAL CHIP 150 5%	1/10W
R419	1-216-065-00	METAL CHIP 4.7K 5%	1/10W
R420	1-216-073-00	METAL CHIP 10K 5%	1/10W
R421	1-216-049-00	METAL CHIP 1K 5%	1/10W
R422	1-216-073-00	METAL CHIP 10K 5%	1/10W
R423	1-216-073-00	METAL CHIP 10K 5%	1/10W
R424	1-216-295-00	METAL CHIP 0 5%	1/10W
R430	1-216-295-00	METAL CHIP 0 5%	1/10W
R431	1-216-295-00	METAL CHIP 0 5%	1/10W
R432	1-216-295-00	METAL CHIP 0 5%	1/10W
R433	1-216-295-00	METAL CHIP 0 5%	1/10W
R453	1-216-073-00	METAL CHIP 10K 5%	1/10W
R457	1-216-073-00	METAL CHIP 10K 5%	1/10W

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remark
R459	1-216-073-00	METAL CHIP	10K	5%	1/10W
R461	1-216-073-00	METAL CHIP	10K	5%	1/10W
R462	1-216-073-00	METAL CHIP	10K	5%	1/10W
R463	1-216-073-00	METAL CHIP	10K	5%	1/10W
R464	1-216-073-00	METAL CHIP	10K	5%	1/10W
R465	1-216-073-00	METAL CHIP	10K	5%	1/10W
R467	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R468	1-216-073-00	METAL CHIP	10K	5%	1/10W
R470	1-216-073-00	METAL CHIP	10K	5%	1/10W
R471	1-216-073-00	METAL CHIP	10K	5%	1/10W
R480	1-216-049-00	METAL CHIP	1K	5%	1/10W
R486	1-216-295-00	METAL CHIP	0	5%	1/10W
R488	1-216-073-00	METAL CHIP	10K	5%	1/10W
⚠R490	1-249-386-11	CARBON	2.7	5%	1/6W F
R499	1-216-073-00	METAL CHIP	10K	5%	1/10W
R501	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R503	1-216-073-00	METAL CHIP	10K	5%	1/10W
R504	1-216-073-00	METAL CHIP	10K	5%	1/10W
R505	1-216-073-00	METAL CHIP	10K	5%	1/10W
R506	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R507	1-216-079-00	METAL CHIP	18K	5%	1/10W
R508	1-216-049-00	METAL CHIP	1K	5%	1/10W
R509	1-216-693-11	METAL CHIP	56K	0.5%	1/10W
R510	1-216-075-00	METAL CHIP	12K	5%	1/10W
R511	1-216-661-11	METAL CHIP	2.7K	0.5%	1/10W
R513	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R514	1-216-103-00	METAL CHIP	180K	5%	1/10W
R515	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R516	1-216-049-00	METAL CHIP	1K	5%	1/10W
R518	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R519	1-216-077-00	METAL CHIP	15K	5%	1/10W
R520	1-216-077-00	METAL CHIP	15K	5%	1/10W
R522	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R524	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R525	1-216-089-00	METAL CHIP	47K	5%	1/10W
R526	1-216-089-00	METAL CHIP	47K	5%	1/10W
R584	1-249-417-11	CARBON	1K	5%	1/4W
R585	1-249-417-11	CARBON	1K	5%	1/4W
R588	1-249-413-11	CARBON	470	5%	1/4W
R589	1-249-413-11	CARBON	470	5%	1/4W
R594	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R595	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R596	1-216-097-00	METAL CHIP	100K	5%	1/10W
R597	1-216-097-00	METAL CHIP	100K	5%	1/10W
R598	1-216-097-00	METAL CHIP	100K	5%	1/10W
R599	1-216-097-00	METAL CHIP	100K	5%	1/10W
R701	1-216-049-00	METAL CHIP	1K	5%	1/10W
R702	1-216-049-00	METAL CHIP	1K	5%	1/10W
R703	1-216-033-00	METAL CHIP	220	5%	1/10W

Ref. No.	Part No.	Description			Remark
R704	1-216-089-00	METAL CHIP	47K	5%	1/10W
R705	1-216-025-00	METAL CHIP	100	5%	1/10W
R707	1-216-075-00	METAL CHIP	12K	5%	1/10W
R708	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R709	1-216-093-00	METAL CHIP	68K	5%	1/10W
R711	1-216-049-00	METAL CHIP	1K	5%	1/10W
R712	1-216-049-00	METAL CHIP	1K	5%	1/10W
R713	1-216-073-00	METAL CHIP	10K	5%	1/10W
R715	1-216-073-00	METAL CHIP	10K	5%	1/10W
R716	1-216-081-00	METAL CHIP	22K	5%	1/10W
R717	1-216-081-00	METAL CHIP	22K	5%	1/10W
R720	1-216-049-00	METAL CHIP	1K	5%	1/10W
R723	1-216-049-00	METAL CHIP	1K	5%	1/10W
R724	1-216-049-00	METAL CHIP	1K	5%	1/10W
R725	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R726	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R727	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R733	1-216-049-00	METAL CHIP	1K	5%	1/10W

< RF MODULATOR >

⚠RF301	1-466-989-11	MODULATOR, RF (VHF/UHF)

< VARIABLE RESISTOR >

RV501	1-223-241-11	RES, ADJ, CARBON 47K
RV502	1-223-241-11	RES, ADJ, CARBON 47K

< TUNER >

⚠TU702	8-598-039-00	TUNER BTF-WA401

< VIBRATOR >

X401	1-579-436-11	VIBLATOR, CRYSTAL (32KHz)
X402	1-579-175-11	VIBRATOR, CERAMIC (10MHz)
X501	1-578-774-11	VIBRATOR, CRYSTAL (12MHz)

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* A-6782-054-A VI-119 BOARD, COMPLETE

****

(Ref. No. 2,000 Series)

* 3-741-933-01 HEAT SINK

7-685-646-79 SCREW +BVTP 3X8 TYPE2 IT-3

< CAPACITOR >

C131	1-124-477-11	ELECT	47uF	20% 25V
C132	1-126-101-11	ELECT	100uF	20% 16V
C301	1-163-031-11	CERAMIC CHIP	0.01uF	50V
C302	1-124-477-11	ELECT	47uF	20% 25V
C303	1-124-477-11	ELECT	47uF	20% 25V
C304	1-124-907-11	ELECT	10uF	20% 50V

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description		Remark	
C305	1-124-477-11	ELECT	47uF	20%	25V
C306	1-163-111-00	CERAMIC CHIP	56PF	5%	50V
C307	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C308	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C309	1-124-907-11	ELECT	10uF	20%	50V
C310	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C311	1-124-472-11	ELECT	470uF	20%	10V
C312	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C313	1-124-472-11	ELECT	470uF	20%	10V
C314	1-163-097-00	CERAMIC CHIP	15PF	5%	50V
C315	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C316	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C317	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C318	1-124-472-11	ELECT	470uF	20%	10V
C319	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C320	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C321	1-124-903-11	ELECT	1uF	20%	50V
C322	1-164-343-11	CERAMIC CHIP	0.056uF	10%	25V
C323	1-163-139-00	CERAMIC CHIP	820PF	5%	50V
C324	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C325	1-124-916-11	ELECT	22uF	20%	63V
C326	1-124-925-11	ELECT	2.2uF	20%	100V
C327	1-124-443-00	ELECT	100uF	20%	10V
C328	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C501	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C502	1-163-036-00	CERAMIC CHIP	0.068uF		50V
C503	1-163-986-00	CERAMIC CHIP	0.027uF	10%	25V
C504	1-163-103-00	CERAMIC CHIP	27PF	5%	50V
C505	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C506	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C507	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C508	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C509	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C510	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C511	1-163-036-00	CERAMIC CHIP	0.068uF		50V
C512	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C513	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C514	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C515	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C516	1-124-443-00	ELECT	100uF	20%	10V
C517	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C518	1-163-036-00	CERAMIC CHIP	0.068uF		50V
C519	1-163-036-00	CERAMIC CHIP	0.068uF		50V
C520	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C521	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C522	1-124-907-11	ELECT	10uF	20%	50V
C523	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C524	1-163-023-00	CERAMIC CHIP	0.015uF	5%	50V
C525	1-163-135-00	CERAMIC CHIP	560PF	5%	50V

Ref. No.	Part No.	Description		Remark	
C526	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C527	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C528	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C529	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C530	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C531	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C533	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C540	1-161-379-00	CERAMIC	0.01uF	20%	25V
C541	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C542	1-163-093-00	CERAMIC CHIP	10PF	5%	50V
C601	1-163-102-00	CERAMIC CHIP	24PF	5%	50V
C614	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C621	1-124-907-11	ELECT	10uF	20%	50V
C625	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C626	1-124-907-11	ELECT	10uF	20%	50V
C627	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C628	1-126-320-11	ELECT, NONPOLAR	10uF	20%	16V
C629	1-124-907-11	ELECT	10uF	20%	50V
C630	1-126-916-11	ELECT	1000uF	20%	6.3V
C631	1-124-907-11	ELECT	10uF	20%	50V
C633	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C634	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C635	1-124-477-11	ELECT	47uF	20%	25V
C636	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C637	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C638	1-126-916-11	ELECT	1000uF	20%	6.3V
C639	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C640	1-163-117-00	CERAMIC CHIP	100PF	5%	50V
C641	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C642	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C643	1-124-927-11	ELECT	4.7uF	20%	100V
C644	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C645	1-124-477-11	ELECT	47uF	20%	25V
C646	1-124-443-00	ELECT	100uF	20%	10V
C647	1-124-907-11	ELECT	10uF	20%	50V
C648	1-124-907-11	ELECT	10uF	20%	50V
C649	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C650	1-124-477-11	ELECT	47uF	20%	25V
C651	1-124-477-11	ELECT	47uF	20%	25V
C654	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C655	1-124-477-11	ELECT	47uF	20%	25V
C656	1-124-443-00	ELECT	100uF	20%	10V
C661	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C664	1-124-477-11	ELECT	47uF	20%	25V
C667	1-126-101-11	ELECT	100uF	20%	16V
C668	1-124-477-11	ELECT	47uF	20%	25V
C669	1-164-095-11	CERAMIC	0.01uF	10%	16V

Ref. No.	Part No.	Description	Remark
		< CONNECTOR >	
CN601	1-563-592-11	CONNECTOR, FLEXIBLE 15P	
* CN602	1-563-604-11	CONNECTOR, FLEXIBLE 27P	
* CN603	1-573-844-11	CONNECTOR, BOARD TO BOARD 12P	
CN611	1-573-846-11	CONNECTOR, BOARD TO BOARD 14P	
CN612	1-573-846-11	CONNECTOR, BOARD TO BOARD 14P	
		< DIODE >	
D602	8-719-109-93	DIODE RD6.2ES-B2	
D603	8-719-109-93	DIODE RD6.2ES-B2	
D604	8-719-109-93	DIODE RD6.2ES-B2	
D606	8-719-109-93	DIODE RD6.2ES-B2	
D607	8-719-109-93	DIODE RD6.2ES-B2	
D608	8-719-109-93	DIODE RD6.2ES-B2	
D611	8-719-109-93	DIODE RD6.2ES-B2	
D612	8-719-109-93	DIODE RD6.2ES-B2	
D613	8-719-109-93	DIODE RD6.2ES-B2	
D614	8-719-109-93	DIODE RD6.2ES-B2	
D615	8-719-109-93	DIODE RD6.2ES-B2	
D616	8-719-109-93	DIODE RD6.2ES-B2	
D617	8-719-109-93	DIODE RD6.2ES-B2	
D618	8-719-109-93	DIODE RD6.2ES-B2	
		< IC >	
IC131	8-759-513-73	IC PQ09RF11	
IC301	8-759-089-80	IC MB90084PF-128	
IC302	8-759-164-09	IC LA7218M-TE-R	
IC501	8-759-098-22	IC M52350FP	
IC604	8-759-008-67	IC MC14066BF	
IC606	8-759-098-23	IC AN3580SB	
IC608	8-752-052-58	IC CXA1410M	
IC611	8-759-925-72	IC SN74HC02ANS	
IC612	8-759-925-72	IC SN74HC02ANS	
		< JUMPER RESISTOR >	
JR303	1-216-025-00	METAL CHIP 100 5% 1/10W	
		< RESISTOR >	
JW058	1-249-405-11	CARBON 100 5% 1/4W	
		< COIL >	
JW096	1-410-526-11	INDUCTOR 10UH	
		< RESISTOR >	
JW099	1-249-417-11	CARBON 1K 5% 1/4W	

Ref. No.	Part No.	Description	Remark
		< COIL >	
JW100	1-412-488-11	INDUCTOR 1UH	
JW103	1-412-494-11	INDUCTOR 3.3UH	
		< COIL >	
L301	1-410-521-11	INDUCTOR 100uH	
L302	1-412-488-11	INDUCTOR 1uH	
L303	1-412-488-11	INDUCTOR 1uH	
L304	1-410-521-11	INDUCTOR 100uH	
L305	1-412-488-11	INDUCTOR 1uH	
L306	1-412-488-11	INDUCTOR 1uH	
L307	1-412-488-11	INDUCTOR 1uH	
L308	1-412-488-11	INDUCTOR 1uH	
L309	1-412-470-21	INDUCTOR 22uH	
L311	1-410-521-11	INDUCTOR 100uH	
L501	1-410-520-11	INDUCTOR 82uH	
L502	1-410-514-11	INDUCTOR 27uH	
L601	1-410-520-11	INDUCTOR 82uH	
L603	1-410-521-11	INDUCTOR 100uH	
L604	1-410-521-11	INDUCTOR 100uH	
L606	1-410-509-11	INDUCTOR 10uH	
		< TRANSISTOR >	
Q301	8-729-010-05	TRANSISTOR MSB709-RT1	
Q302	8-729-421-22	TRANSISTOR UN2211	
Q303	8-729-424-73	TRANSISTOR UN2219-TX	
Q304	8-729-010-25	TRANSISTOR MSD601-RT1	
Q305	8-729-421-22	TRANSISTOR UN2211	
Q306	8-729-424-08	TRANSISTOR UN2111	
Q307	8-729-010-05	TRANSISTOR MSB709-RT1	
Q308	8-729-010-05	TRANSISTOR MSB709-RT1	
Q309	8-729-010-05	TRANSISTOR MSB709-RT1	
Q311	8-729-421-22	TRANSISTOR UN2211	
Q312	8-729-010-05	TRANSISTOR MSB709-RT1	
Q502	8-729-421-19	TRANSISTOR UN2213	
Q503	8-729-010-05	TRANSISTOR MSB709-RT1	
Q551	8-729-421-19	TRANSISTOR UN2213	
Q552	8-729-421-19	TRANSISTOR UN2213	
Q553	8-729-421-19	TRANSISTOR UN2213	
Q602	8-729-010-25	TRANSISTOR MSD601-RT1	
Q603	8-729-010-05	TRANSISTOR MSB709-RT1	
Q604	8-729-010-25	TRANSISTOR MSD601-RT1	
Q609	8-729-010-25	TRANSISTOR MSD601-RT1	
Q610	8-729-010-25	TRANSISTOR MSD601-RT1	
		< RESISTOR >	
R301	1-216-039-00	METAL CHIP 390 5% 1/10W	

Ref. No.	Part No.	Description			Remark
R302	1-216-081-00	METAL CHIP	22K	5%	1/10W
R303	1-216-073-00	METAL CHIP	10K	5%	1/10W
R304	1-216-047-00	METAL CHIP	820	5%	1/10W
R305	1-216-075-00	METAL CHIP	12K	5%	1/10W
R306	1-216-655-11	METAL CHIP	1.5K	0.5%	1/10W
R307	1-216-041-00	METAL CHIP	470	5%	1/10W
R308	1-216-049-00	METAL CHIP	1K	5%	1/10W
R309	1-216-041-00	METAL CHIP	470	5%	1/10W
R310	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R311	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R312	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R313	1-249-421-11	CARBON	2.2K	5%	1/4W
R315	1-216-295-00	METAL CHIP	0	5%	1/10W
R316	1-216-295-00	METAL CHIP	0	5%	1/10W
R317	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R318	1-216-101-00	METAL CHIP	150K	5%	1/10W
R319	1-216-043-00	METAL CHIP	560	5%	1/10W
R320	1-249-429-11	CARBON	10K	5%	1/4W
R321	1-216-081-00	METAL CHIP	22K	5%	1/10W
R322	1-216-073-00	METAL CHIP	10K	5%	1/10W
R323	1-216-041-00	METAL CHIP	470	5%	1/10W
R324	1-216-041-00	METAL CHIP	470	5%	1/10W
R325	1-216-041-00	METAL CHIP	470	5%	1/10W
R326	1-216-041-00	METAL CHIP	470	5%	1/10W
R327	1-216-073-00	METAL CHIP	10K	5%	1/10W
R328	1-216-073-00	METAL CHIP	10K	5%	1/10W
R329	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R330	1-216-077-00	METAL CHIP	15K	5%	1/10W
R501	1-216-692-11	METAL CHIP	51K	0.5%	1/10W
R502	1-216-692-11	METAL CHIP	51K	0.5%	1/10W
R503	1-216-687-11	METAL CHIP	33K	0.5%	1/10W
R505	1-216-049-00	METAL CHIP	1K	5%	1/10W
R506	1-216-295-00	METAL CHIP	0	5%	1/10W
R507	1-216-661-11	METAL CHIP	2.7K	0.5%	1/10W
R510	1-216-660-11	METAL CHIP	2.4K	0.5%	1/10W
R511	1-216-077-00	METAL CHIP	15K	5%	1/10W
R512	1-216-073-00	METAL CHIP	10K	5%	1/10W
R513	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R514	1-216-687-11	METAL CHIP	33K	0.5%	1/10W
R515	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R516	1-216-099-00	METAL CHIP	120K	5%	1/10W
R517	1-216-094-00	METAL GLAZE	75K	5%	1/10W
R520	1-216-665-11	METAL CHIP	3.9K	0.5%	1/10W
R521	1-216-668-11	METAL CHIP	5.1K	0.5%	1/10W
R530	1-249-414-11	CARBON	560	5%	1/4W
R531	1-216-043-00	METAL CHIP	560	5%	1/10W
R532	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R533	1-216-043-00	METAL CHIP	560	5%	1/10W
R534	1-216-049-00	METAL CHIP	1K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R535	1-216-049-00	METAL CHIP	1K	5%	1/10W
R550	1-216-295-00	METAL CHIP	0	5%	1/10W
R551	1-216-671-11	METAL CHIP	6.8K	0.5%	1/10W
R552	1-216-677-11	METAL CHIP	12K	0.5%	1/10W
R553	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R555	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R601	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R602	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R603	1-216-045-00	METAL CHIP	680	5%	1/10W
R604	1-216-049-00	METAL CHIP	1K	5%	1/10W
R605	1-216-033-00	METAL CHIP	220	5%	1/10W
R606	1-216-033-00	METAL CHIP	220	5%	1/10W
R608	1-249-401-11	CARBON	47	5%	1/4W
R609	1-216-036-00	METAL CHIP	300	5%	1/10W
R610	1-216-049-00	METAL CHIP	1K	5%	1/10W
R620	1-216-048-00	METAL CHIP	910	5%	1/10W
R621	1-216-049-00	METAL CHIP	1K	5%	1/10W
R625	1-216-020-00	METAL GLAZE	62	5%	1/10W
R626	1-216-020-00	METAL GLAZE	62	5%	1/10W
R627	1-216-021-00	METAL CHIP	68	5%	1/10W
R628	1-216-021-00	METAL CHIP	68	5%	1/10W
R629	1-249-403-11	CARBON	68	5%	1/4W
R630	1-216-021-00	METAL CHIP	68	5%	1/10W
R631	1-216-022-00	METAL CHIP	75	5%	1/10W
R633	1-216-079-00	METAL CHIP	18K	5%	1/10W
R634	1-216-079-00	METAL CHIP	18K	5%	1/10W
R639	1-216-041-00	METAL CHIP	470	5%	1/10W
R650	1-249-409-11	CARBON	220	5%	1/4W
R651	1-249-408-11	CARBON	180	5%	1/4W
R652	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R673	1-216-073-00	METAL CHIP	10K	5%	1/10W
R674	1-216-073-00	METAL CHIP	10K	5%	1/10W
R676	1-216-073-00	METAL CHIP	10K	5%	1/10W
R677	1-216-073-00	METAL CHIP	10K	5%	1/10W
R681	1-216-025-00	METAL CHIP	100	5%	1/10W
R682	1-216-025-00	METAL CHIP	100	5%	1/10W
R683	1-216-025-00	METAL CHIP	100	5%	1/10W
R684	1-216-025-00	METAL CHIP	100	5%	1/10W
R685	1-216-025-00	METAL CHIP	100	5%	1/10W
R686	1-216-025-00	METAL CHIP	100	5%	1/10W

< VARIABLE RESISTOR >

RV501	1-223-239-11	RES, ADJ, CARBON 10K
RV502	1-223-239-11	RES, ADJ, CARBON 10K

< VIBRATOR >

X301	1-577-381-11	VIBRATOR, CRYSTAL (14.32MHz)
X302	1-577-165-11	VIBLATOR, CERAMIC (500KHz)

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Ref. No.	Part No.	Description	Remark
		MISCELLANEOUS	
		**********	
3	1-467-096-21	SWITCH BLOCK, CONTROL	
⚠55	1-413-825-11	POWER BLOCK (SP-460 BOARD)	
104	1-751-174-12	CABLE, FLEXIBLE FLAT (29 CORE)	(FSA-1)
105	1-751-175-12	CABLE, FLEXIBLE FLAT (27 CORE)	(FVA-1)
106	1-751-176-12	CABLE, FLEXIBLE FLAT (15 CORE)	(FVA-2)
112	1-558-924-21	CABLE, PIN	
* 162	1-564-013-11	PIN, CONNECTOR 3P	
260	1-543-647-11	HEAD, FE	
264	8-848-607-01	DRUM ASSY, ROTARY UPPER (DZR-61-R)	
* 338	1-564-013-11	PIN, CONNECTOR 3P	
IC131	8-759-513-73	IC PQ09RF11	
⚠IC501	8-759-513-72	IC PQ12RF11	
⚠M901	8-848-606-11	DRUM ASSY (DZH-61A-R)	
⚠M902	8-835-489-01	MOTOR, DC U-26K (CAPSTAN)	
M903	X-3733-302-1	MOTOR ASSY, CAM	
M904	X-3727-784-1	MOTOR ASSY (LOADING)	
Q401	8-729-141-83	TRANSISTOR 2SA473	
S1	1-692-062-11	SWITCH, ROTARY (CAM ENCODER)	
⚠TU702	8-598-039-00	TUNER BTF-WA401	

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ACCESSORIES & PACKING MATERIALS

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	1-417-139-11	MATCHING TRANSFORMER, ANTENNA	
	1-466-905-11	CABLE MOUSE	
	1-467-098-11	REMOTE COMMANDER (RMT-V129A)	
	1-562-443-11	CONNECTOR, ANTENNA	
	1-575-335-21	CORD, CONNECTION	
⚠	1-590-135-31	CORD, POWER	
	1-696-592-11	CORD, CONNECTION (NTSC)	
	1-751-271-11	CORD, CONNECTION	
	3-756-672-21	MANUAL, INSTRUCTION (ENGLISH)	(US, Canadian)
	3-756-672-32	MANUAL, INSTRUCTION (FRENCH)	(Canadian)
*	3-954-688-01	INDIVIDUAL CARTON	
*	3-954-689-01	CUSHION (UPPER)	
*	3-954-690-01	CUSHION (LOWER)	

****

Ref. No.	Part No.	Description	Remark
		**********	
		HARDWARE LIST	
		**********	
#1	7-685-648-79	SCREW +BVTP 3X12 TYPE2 IT-3	
#2	7-685-104-19	SCREW +P 2X6 TYPE2	
#3	7-621-255-25	SCREW +PTT 2X4 (S)	
#5	7-685-649-79	SCREW +BVTP 3X14 TYPE2 IT-3	
#7	7-685-647-79	SCREW +BVTP 3X10 TYPE2 IT-3	
#8	7-682-645-01	SCREW +PS 3X4	
#9	7-685-102-19	SCREW +P 2X4 NON-SLIT TYPE 2	
#10	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3	
#11	7-682-548-04	SCREW +P 3X8	
#12	7-682-546-04	SCREW +P 3X5	
#13	7-621-732-08	SCREW	
#14	7-628-254-05	SCREW +PS 2.6X5	

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The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

7-1. SYSTEM CONTROL — VIDEO BLOCK INTERFACE

Signal	Pin No.	I/O	STOP/FF/REW	TAPE THREADING	TAPE UNTHREADING	PB	PB・PAUSE	SLOW	×2	CUE	REVIEW	REC	REC・PAUSE
V・PB	ST-49 Board IC503 ㊽	O	H	H	H	L	L	L	L	L	L	H	H
HEAD CONT	ST-49 Board IC503 ㊾	O	L	L	L	L	HI-Z (2.5V)	*1	*10	*5	*5	L	L
RF SW P (SW30)	ST-49 Board IC503①	O	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
Q VD/V MUTE	ST-49 Board IC503②	O	L	L	L	*3	*4	*4	*4	*4	*4	L	L
RF SW POS	ST-49 Board IC503 ㊿	I	Input pin for video RF switching position adjustment										
SP	ST-49 Board IC503 ㊻	O	*6	*6	*6	*7	*7	*7	*7	*7	*7	*6	*6
RF ENV.	ST-49 Board IC503 ㊺	I	Video RF envelope signal input pin for auto-tracking and APC										
LP	ST-49 Board IC503 ㊹	O	L	L	L	*7	*7	*7	*7	*7	*7	L	L
REC・P	ST-49 Board IC503⑤	O	L	L	L	L	L	L	L	L	L	L	H
REC	ST-49 Board IC503 ㊸	O	L	L	L	L	L	L	L	L	L	H	H
V SYNC	ST-49 Board IC503 ㊷	I	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8
OSD MUTE	ST-49 Board IC503 ㊶	O	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9
ORC SETTEI	ST-49 Board IC503 ㊵	O	L	L	L	L	L	L	L	L	L	*11	*11
EP CR	ST-49 Board IC503 ㊴	O	H	H	H	H	H	H	H	*12	*12	H	H
YC DATA	ST-49 Board IC503 ㊳	O	*13	*13	*13	*13	*13	*13	*13	*13	*13	*13	*13
YC CLK	ST-49 Board IC503 ㊲	O	*13	*13	*13	*13	*13	*13	*13	*13	*13	*13	*13
ENV GAIN	ST-49 Board IC503 ㊱	O	*14	*14	*14	*14	*14	*14	*14	*14	*14	*14	*14
EDIT	ST-49 Board IC503 ㊰	O	*15	*15	*15	*15	*15	*15	*15	*15	*15	*15	*15
JOG	ST-49 Board IC503 ㉘	O	L	L	L	L	H	H	H	H	H	L	L
FE ON	ST-49 Board IC503⑥	O	L	L	L	L	L	L	L	L	L	*16	L
S VHS	ST-49 Board IC503 ㉙	O	*19	*19	*19	*20	*20	*20	*20	*20	*20	*19	*19
S DET	ST-49 Board IC503 ㉚	I	*17	*17	*17	*18	*18	*18	*18	*18	*18	*17	*17

*1. Forward slow mode : "HI-Z (2.5V)" in tape stop, "L" in tape running (approx. 40 msec.).
Reverse slow mode : "HI-Z (2.5V)" in tape stop, "H" in tape running SP mode (approx. 40 msec.),
"L" in tape running EP mode (approx. 40 msec.).
*2. 30Hz 50% duty pulse synchronizing with drum rotation.
*3. Normally "L". "H" when the video signal is not detected.
*4. V period "H" pulse.
*5. "H" in the SP mode. "L" in the EP mode.
*6. "L" in the SP mode. "H" in the EP mode.
*7. Selected according to the tape recording mode.

Signal \ Mode	SP	LP	EP
SP㊶	L	H	H
EP㊷	L	L	H
LP㊸	L	H	L

7-2. SYSTEM CONTROL — SERVO PERIPHERAL CIRCUIT INTERFACE

Signal	Pin No.	I/O	STOP	FF	REW	TAPE THREADING	TAPE UNTHREADING	PB	PB・PAUSE	SLOW	×2	CUE	REVIEW	REC	REC・PAUSE	PB INDEX WRT/ERS
REC CTL	ST-49 Board IC503⑦	O	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z	HI-Z	*1	HI-Z	
CAP STOP	ST-49 Board IC503⑨	O (O.D)	L	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	L	*3	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	HI-Z (O.D)	
STEP PLS	ST-49 Board IC503⑩	O	L	L	L	L	L	L	L	*2	L	L	L	L	L	
CTL REC	ST-49 Board IC503⑫	O	L	L	L	L	L	L	L	L	L	L	L	H	H	H
INDEX	ST-49 Board IC503⑭	O	L	L	L	L	L	L	L	L	L	L	L	L	L	H
PB CTL	ST-49 Board IC503⑯	I	H	*6	*6			*1	H/L	*2	*6	*6	*6	*1	H	
VD CTL	ST-49 Board IC503⑰	I	H	*6	*6			*1	H/L	*2	*6	*6	*6	*1	H	
DRUM PG	ST-49 Board IC503⑱	I	*4	*7	*7	*5	*5	*7	*7	*7	*7	*7	*7	*7	*7	
DRUM FG	ST-49 Board IC503⑲	I	*4	*8	*8	*5	*5	*8	*8	*8	*8	*8	*8	*8	*8	
CAP FG	ST-49 Board IC503⑳	I	H/L	*6	*6	*5	*5	*6	H/L	*9	*6	*6	*6	*6	H/L	
CAP RVS	ST-49 Board IC503㉑	O	H/L	L	H	L	H	L	L	*2	L	L	H	L	L	
CAP DA	ST-49 Board IC503㉓	O	*10	*10	*10	*10	*10	*11	*10	*10	*11	*11	*11	*11	*10	
DRUM DA	ST-49 Board IC503㉔	O	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	
CTL STEP	ST-49 Board IC503㉖	O	L	L	L	L	L	L	L	*13	L	L	L	L	L	

*1. 30Hz pulse.
*2. Pulse in tape running.
*3. Reverse logic pulse of STEP PLS.
*4. "L" when drum rotation stops
*5. Unstable period pulse.
*6. Pulse of period proportionate to tape speed
*7. 30Hz pulse.
*8. 360Hz pulse.
*9. Pulse in tape running.
*10. Approx. 2msec. period "H" or "L" pulse.
*11. Approx. 1.5msec. period "H" or "L" pulse.
*12. Approx. 3msec. period "H" or "L" pulse.
*13. "H" in FWD direction and STEP drive.

*8. Composite sync signal (positive).
*9. "H" when menu screen or blue back screen.
*10. "H" in the SP mode, "HI-Z (2.5V)" in the EP mode.
*11. "H" while APC is set.
*12. "L" only in the EP mode.
*13. AXEL・APC··· Serial communication.
*14. "H" while (SP + ORC SETTEI) APC is set or in the LP/EP mode.
*15. "H" in the EDIT MODE
*16. "H" for 7 sec. in the SP mode and for 21 sec. in the EP mode after REC starts.
*17. Igmore.
*18. "H" input when discriminating the S VHS mode in S tape playback.
*19. "L" when the S tape is loaded and the user S switch is ON at the same time.
*20. "L" when the Pin ㉚ S DET input is "H".

7-3. SYSTEM CONTROL — MECHANISM BLOCK INTERFACE

Signal	Pin No.	I/O	HI-SPEED REW	EJECTED	CASSETTE LOADING	CASETTE UNLOAD-ING	TAPE THREAD-ING	TAPE UNTH-READING	STOP	FF	REW	PB	PB · PAUSE	SLOW	×2	CUE	REVIEW	REC	REC · PAUSE
CAM *1	ST-49 Board IC503㉘	O	L	L	L	L	H	H	L	L	L	L	L	L	L	L	L	L	L
LOAD	ST-49 Board IC503㉙	O	L	L	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L
CW/CCW	ST-49 Board IC503㉚	O			H	L	H	L											
MODE 1	ST-49 Board IC503㉖	I	H	L	L	L	H	H	L	H	H	H	L	L	H	H	H	H	L
MODE 2	ST-49 Board IC503㉗	I	L	H	H	H	H	H	L	L	L	L	H	H	L	L	L	L	H
MODE 3	ST-49 Board IC503㉘	I	H	H	H	H	L	L	L	L	L	H	H	H	H	H	L	H	H
MODE 4	ST-49 Board IC503㉕	I	H	H	H	H	H	H	L	H	H	L	L	L	L	L	L	L	L
REC PRF	ST-49 Board IC503⑮	I	*2	L	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
C-UP/ DOWN	ST-49 Board IC503⑯	I	L	H	H→L	L→H	L	L	L	L	L	L	L	L	L	L	L	L	L
T REEL	ST-49 Board IC503㉔	I	*3	H/L	H/L	H/L	H/L	H/L	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
S REEL	ST-49 Board IC503㉓	I	*3	H/L	H/L	H/L	*3	*3	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
END LED	ST-49 Board IC503㉜	O (O.D)	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
DEW	ST-49 Board IC503㉛	I	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
$\overline{\text{CAP TRQ 1}}$	ST-49 Board IC503㉞	O (O.D)	*1							*1	*1			*6		*1	*1		
$\overline{\text{CAP TRQ 2}}$	ST-49 Board IC503㉝	O (O.D)								*1	*1								
$\overline{\text{CAP STOP}}$	ST-49 Board IC503㉟	O (O.D)	H	L	L	L	H	H	L	H	H	H	L	*8	H	H	H	H	L
CAP RVS	ST-49 Board IC503㉗	O	H	H			L	H	H/L	L	H	L	L	L/*8	L	L	H	L	L
CAP DA *8	ST-49 Board IC503㉗	O																	
T SENS	ST-49 Board IC503⑰	I	*7	*4	*4	*4	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
S SENS	ST-49 Board IC503⑱	I	*7	*4	*4	*4	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
S CAS	ST-49 Board IC503⑲	I	*9	H	H	H	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9

*1. "H" in mechanism mode transition.
*2. "L" when the erasing protection tab is bent, "H" when not bent.
*3. Pulse of period proportionate to reel rotating speed.
*4. Approx. 2 msec. period "H" pulse.
*5. Normally DC voltage below 3.5V.
*6. "L" only in tape running and when CAP RVS is "H".
*7. Normally "L". 2 msec. period "H" pulse when tape top or tape end is detected.
*8. Pulse in tape running.
*9. "H" when S tape is loaded.

7-4. SYSTEM CONTROL — SYSTEM CONTROL PERIPHERAL CIRCUIT INTERFACE

Signal	Pin No.	I/O	I/O Level
COSMO · RESET	ST-49 board IC503 ㊽	I	Normally "H". "L" when service interruption is detected or restored.
COSMO · CS	ST-49 board IC503 ㊹	I	Chip select signal from the timer microprocessor. V period "L" pulse.
SI · BUS	ST-49 board IC503 ㊺	I	Serial communication data from the timer microprocessor. V period "L" pulse.
SO · BUS	ST-49 board IC503 ㊻	O	Serial communication data to the timer microprocessor. V period "L" pulse.
S CLK	ST-49 board IC503 ㊼	I	Serial communication clock with the timer microprocessor. V period "L" pulse.

7-5. SYSTEM CONTROL — AUDIO BLOCK INTERFACE

Signal	Pin No.	I/O	STOP/ FF/ REW	TAPE LOADING	TAPE UNLOADING	PB	PB · PAUSE	SLOW	× 2	CUE	REVIEW	REC	REC · PAUSE
AF PB	ST-49 Board IC503 ㊾	O	L	L	L	H	H	H	H	H	H	L	L
RF/M/N	ST-49 Board IC503 ㊿	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
STEREO/ L/R	ST-49 Board IC503 (51)	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
AF ENVELOP	ST-49 Board IC503 (52)	I	AF RF envelope signal input pin for auto tracking.										
NA PB	ST-49 Board IC503 (53)	O	L	L	L	H	H	H	H	H	H	L	L
A MUTE	ST-49 Board IC503 (54)	O (O.D)	L	L	L	*4	H	H	H	H	H	L	L
SP	ST-49 Board IC503 (55)	O	*2	*2	*2	*3	*3	*3	*3	*3	*2	*2	*2
NA REC · P	ST-49 Board IC503 (56)	O	L	L	L	L	L	L	L	L	L	H	L
AF REC P	ST-49 Board IC503 (4)	O	L	L	L	L	L	L	L	L	L	H	L
AF SWP	ST-49 Board IC503 (58)	O	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
AF SW POSITION	ST-49 Board IC503 (59)	I	Input pin for AF switching position adjustment.										
AF CONT	ST-49 Board IC503 (60)	O	L	L	L	L	L	L	L	L	L	H	L
METER (L)	ST-49 Board IC503 (61)	I	Input pin for audio level meter (left) display.										
METER (R)	ST-49 Board IC503 (62)	I	Input pin for audio level meter (right) display.										
FULL ERS	ST-49 Board IC503 (63)	O (O.D)	H	H	H	H	H	H	H	H	H	L	H

*1. Selected according to audio monitor.
Menu mode setting audio mix

Signal \ Audio Monitor	STEREO OR MAIN, SUB, L, R	MAIN L	SUB R	(NORMAL)	MIX ON
FF/M/N	L	L	L	H	Hi Z (2.5V)
ST/L/R	H	Hi Z (2.5V)	L	L	H

*2. Selected according to SP/EP selector. "L" in the SP mode, "H" in the EP mode.
*3. Selected according to the tape recording mode. "L" in the SP mode, "H" in the EP mode.
*4. "H" when the CTL signal has not been played back.
*5. 30Hz 50% duty pulse approximately 5msec. delayed from RF SW P.

7-6. SYSTEM CONTROL — TUNER BLOCK INTERFACE

Signal	Pin No.	I/O	I/O Level
STEREO	ST-49 Board IC503 (7)	I	Tuner audio mode input pin. "L" when stereo.
BILING	ST-49 Board IC503 (8)	I	Tuner audio mode input pin. "L" when bilingual.
TA MUTE	ST-49 Board IC503 (9)	O	Tuner audio mute output. "H" when the selected channel is operating or when an unused channel is selected.
F MONO	ST-49 Board IC503 (10)	O (O.D)	"H" when tuner audio or auto stereo is off.

7-7. SYSTEM CONTROL — RF MODULATOR, INPUT SELECTION BLOCK INTERFACE

Signal	Pin No.	I/O	I/O Level
TV/VTR	ST-49 Board IC503 (3)	O	"L" when RF modulator through.

*INPUT SEL

Signal \ Mode / Pin No.		TUNER			SAT			LINE			BS MONI
		MONO	STEREO	BILING	MONO	STEREO	BILING	L1	L2	L3	
LINE 1	ST-49 Board IC503 (1)	L	L	L	H	H	H	H	L	H	L
LINE 2	ST-49 Board IC503 (2)	L	L	L	H	H	H	L	H	L	L
LINE 3	ST-49 Board IC503 (75)	L	L	L	L	L	L	L	L	H	L
MAIN/SAP	ST-49 Board IC503 (76)	L	L	L	L	L	L	L	L	L	L
BS BIL	ST-49 Board IC503 (77)	L	L	L	L	L	H	L	L	L	L
BS MONI	ST-49 Board IC503 (78)	L	L	L	L	L	L	L	L	L	H
Y/C	ST-49 Board IC503 (79)	L	L	L	L	L	L	H when S select	H when S select	H when S select	L

*. S select ····· When S is pressed

7-8. SERVO/SYSTEM CONTROL — MICROPROCESSOR PIN FUNCTION (ST-49 BOARD IC503)

Pin No.	Port	I/O	Signal	Function
1	PB5/PPO13	O	$\overline{RF}$ SWP	RF switching pulse
2	PB4/PPO12	O	QVD	False VD
3	PB3/PPO11	O	$\overline{QHD}$ ENBL	False HD voltage level control
4	PB2/PPO10	O	$\overline{AF}$ REC P	Hi-Fi recording control
5	PB1/PPO9	O	REC P	Recording signal
6	PB0/PPO8	O	$\overline{FE}$ ON	Flying erase
7	PC7/RTO7	I/O	$\overline{REC}$ CTL	REC · CTL
8	PC6/RTO6	I/O	Y/C	"H" when input selection control S pin is selected
9	PC5/RTO5	I/O	LINE 1	Input selection control signal
10	PC4/RTO4	I/O	$\overline{NA}$ REC P	Normal audio recording signal
11	PC3/RTO3	I/O	NA PB	Normal audio playback mode
12	PC2/PPO18	I/O	ORC SETTEI	"H" while APC is set
13	PC1/PPO17	I/O	AF REC CONT	Hi-Fi recording control signal
14	PC0/PPO16	I/O	EP C/R	"L" output when EP C/R
15	PJ7	I/O	C IN/$\overline{REC}$ PRF	Cassette IN and erasing protection tab detection switch input
16	PJ6	I/O	C $\overline{DOWN}$	Cassette compartment down switch input
17	PJ5	I/O	T SENS	Tape end sensor input
18	PJ4	I/O	S SENS	Tape top sensor input
19	PJ3	I/O	BS MONITOR	"H" when BS monitor
20	PJ2	I/O	CTL STEP	One-shot mode control signal when slow
21	PJ1	I/O	$\overline{STEREO}$	Stereo audio indication input
22	PJ0	I/O	$\overline{BILING}$	Bilingual audio indication input
23	PD7	I/O	ANT VTR	TV/VTR selection
24	PD6	I/O	CTL INDEX	CTL amplifier, index mode signal
25	PD5	I/O	CTL REC	CTL amplifier, recording current control REC→H
26	PD4	I/O	$\overline{MAIN}$/SAP	Tuner audio selection signal
27	PD3	I/O	TA MUTE	Tuner audio mute signal
28	PD2	I/O	CAM	Cam motor selection
29	PD1	I/O	LOAD	Loading motor selection
30	PD0	I/O	CW	Motor rotating direction control
31	PH7	O	F MONO	Forcible monaural audio control. "H" when monaural
32	PH6	O	$\overline{END}$ LED	Top/end detection lamp lighting control
33	PH5	O	$\overline{CAP}$ TRQ 2	Capstan current control signal 2
34	PH4	O	$\overline{CAP}$ TRQ 1	Capstan current control signal 1
35	PH3	O	S $\overline{VHS}$	"L" output in S VHS mode
36	PH2	O	FULL $\overline{ERS}$	Full erase control
37	PH1	O	A MUTE	Audio mute
38	PH0	O	CAP $\overline{STOP}$	Capstan stop reversal
39	MP			GND
40		I	$\overline{COSMO}$ RESET	System reset input
41	Vss			GND
42	XTAL		XTAL	System clock 12MHz
43	EXTAL		EXTAL	System clock 12MHz
44	$\overline{CSO}$		$\overline{COSMO}$ CS	Chip select signal
45			SI BUS	Serial communication signal
46			SO BUS	Serial communication signal
47			$\overline{S}$ CLK	Serial communication signal
48	PF7/AN11	I/O	METER L	Level meter Lch level
49	PF6/AN10	I/O	METER R	Level meter Rch level
50	PF5/AN9	O	NC	

Pin No.	Port	I/O	Signal	Function
51	PF4/AN8	I	$\overline{APSW}$ POS	HiFi switching position adjustment
52	AV_{SS}		AV_{SS}	GND
53	AV_{REF}		AV_{REF}	AD port reference input D5V
54	AV_{DD}		AV_{DD}	D5V
55	PF3/AN7	I	MODE 4	Cam encoder data 4
56	PF2/AN6	I	MODE 3	Cam encoder data 3
57	PF1/AN5	I	MODE 2	Cam encoder data 2
58	PF0/AN4	I	MODE 1	Cam encoder data 1
59	AN3	I	DEW	Condensation sensor input. "H" when condensation
60	AN2	I	$\overline{RE}$ ENV	Video playback signal envelope
61	AN1	I	$\overline{AF}$ ENV	Hi-Fi audio playback signal envelope
62	AN0	I	$\overline{SW}$ POS	Video head switching position adjustment
63	PG7/EXI1	I	S REEL FG	S side reel FG input
64	PG6/EXI0	I	T REEL FG	T side reel FG input
65	PG5/SYNC1	I	S DET	S tape detection input in playback mode
66	PG4/SYNC0	I	V SYNC	Composite sync input
67	PG3/PBCTL	I	$\overline{PB}$ CTL	Servo CTL input
68	PG2/DPG	I	$\overline{DRM}$ PG	Drum PG input
69	PG1/DFG	I	$\overline{DRM}$ FG	Drum FG input
70	PG0/CFG	I	$\overline{CAP}$ FG	Capstan FG input
71	PE7/DAB1	O	OSD MUTE	Video output mute signal
72	PD6/DAB0	O	CAP RVS	Capstan reverse control
73	PE5/DAA1	O	$\overline{CAP}$ DA	Capstan D/A output
74	PE4/DAA0	O	$\overline{DRM}$ DA	Drum D/A output
75	PE3/PWM1	O	LINE 3	Input selection control signal
76	PE2/PWM0	O	STEP PLS	Step pulse
77	PE1/EC/INT	I	$\overline{VD}$ CTL	CTL counter input
78	PE0/INT0	I	NC	
79	PI7/SIL	I/O	S CAS	"H" when S cassette detection switch input is S.
80	PI6/SOL	I/O	AX DATA	AXEL control serial data
81	PI5/SCKL	I/O	AX SCLK	AXEL control serial clock
82	PI4/INT1	I/O	LINE 2	Input selection control signal
83	PI3/TO	I/O	$\overline{RF}$/M/N	Audio output control signal. Tertiary value control
84	PI2/TO	I/O	STREO/L/$\overline{R}$	Audio output control signal. Tertiary value control
85	PI1/PO	I/O	HEAD CONT	Head selection control
86	PI0/OSC1	I	NC	
87			NC	
88	V_{SS}		V_{SS}	GND
89	V_{DD}		V_{DD}	D5V
90			NC	Connected to D5V
91	PA7/PPO7	O	ENV GAIN	"L" in SP mode or while ACP is set
92	PA6/PPO6	O	$\overline{SP}$	SP mode reversal
93	PA5/PPO5	O	LP	LP mode
94	PA4/PPO4	O	EDIT	Edit mode
95	PA3/PPO3	O	$\overline{V}$ $\overline{PB}$	Video system playback mode reversal
96	PA2/PPO2	O	JOG	"H" output in variable speed playback
97	PA1/PPO1	O	BS BILING	"H" output in BS bilingual mode
98	PA0/PPO0	O	AF PB	Hi-Fi audio playback mode
99	PB7/PPO15	O	REC	Head amplifier recording power supply
100	PB6/PPO14	O	$\overline{AF}$ SWP	AF switching pulse

7-9. TIMER/TUNER CONTROL — MICROPROCESSOR PIN FUNCTION (ST-49 BOARD IC401)

Pin No.	Port	I/O	Signal	Function
1	CL 1		CL 1	Liquid crystal oscillation pin (32 kHz)
2	CL 0		CL 0	Liquid crystal oscillation pin (32 kHz)
3	MOD 0		MOD 0 (GND)	Operation mode specification pin (GND when used)
4	MOD 1		MOD 1 (GND)	Operation mode specification pin (GND when used)
5	X 0		X 0	Liquid crystal oscillation pin (10 MHz)
6	X 1		X 1	Liquid crystal oscillation pin (10 MHz)
7	V_{SS}		V_{SS}	GND
8	XRST	I	RESET	Reset input pin
9	P00/EI20	O	BS LED	BS input LED
10	P01/EI21	O	SCC LED	SCC input LED
11	P02/EI22	O	JC-SAT LED	JC-SAT input LED
12	P03/EI23	O	NEW LED	NEW input LED
13	P04/EI24	O	EDIT LED	Synchro EDIT LED
14	P05/EI25	O	TIMER LED	Reservation LED
15	P06/EI26	O	REC LED	Recording LED
16	P07/EI27	O	ORC LED	APC LED
17	P10/EI10	I	Power Fail	Power voltage drop detection pin
18	P11/EI11	I	V Sync	V sync input
19	P12/EI12	O	LCD CS	LCD driver CS
20	P13/EI13	O	COSMO CS	Cosmo chip select
21	P14	I	S VHS sw	S VHS/VHS recording mode selection
22	P15	I	Not used	
23	P16	I	Door sw	Membrane open/close detection
24	P17	O	COSMO RESET	Resets all microprocessors other than T/T
25	P20	O	Power Cont	Power supply state output
26	P21	I	H DET	H DET signal input
27	P22	O	CG CS	Character generator chip select
28	CMOD	I	CMOD (V_{DD})	Start mode selection input (V_{DD})
29	P24/SI0	O	Not used	
30	P25/SO0	O	Not used	
31	P26/SCK0	O	Not used	
32	P27/RMCI	I	SIRCS IN	Remote control input
33	P30	O	PLL CLOCK	Tuner PLL clock
34	P31	O	PLL DATA	Tuner PLL data
35	P32	O	PLL ENABLE	Tuner chip select
36	P33/PWM0	O	CFL cont	Cold-cathode tube luminance control output
37	P34/PPG0	O	AUTO PRESET	Auto preset execution display
38	P35/PPG1	O	SAT CS	BS/CS microprocessor chip select
39	FS00	O	Not used	
40	FS01	O	Not used	
41	FS02	O	Not used	
42	FS03	O	Not used	
43	FS04	O	Not used	
44	FS05	O	Not used	
45	FS06	O	Not used	
46	FS07	O	Not used	
47	FS08	O	Not used	
48	FS09	O	Not used	
49	V_{CC}	I	Power supply	
50	FS10	O	Not used	

Pin No.	Port	I/O	Signal	Function
51	FS11	O	Not used	
52	FS12	O	Not used	
53	V_{FDP}	I	GND	Connected to GND as FDP is not used
54	FS13	O	Not used	
55	FS14	O	Not used	
56	FS15	O	Not used	
57	FS16	O	Not used	
58	V_{SS}	I	GND	
59	FS17	O	Not used	
60	FS18	O	Not used	
61	FS19	O	Not used	
62	FC11/FS20	O	Not used	
63	FC10/FS21	O	Not used	
64	FC09/FS22	O	Not used	
65	FC08/FS23	O	Not used	
66	FS07/FS24	O	Not used	
67	V_{CC}	I	V_{CC}	Power supply pin
68	FC06	O	Not used	
69	FC05	O	Not used	
70	FC04	O	Not used	
71	FC03	O	Not used	
72	FC02	O	Not used	
73	FC01	O	Not used	
74	FC00	O	Not used	
75	P80/STB	I	S/V CONT	Front input pin S input detection
76	P81/XCS	I	Not used	
77	P82/SI1	I	SERIAL IN	Serial data input
78	P83/SO1	O	SERIAL OUT	Serial data output
79	P84/SCK1	O	SERIAL CLK	Serial communication clock
80	P85/ECK	O	MEM CS	EEPROM CS
81	P86/TO1	O	MEM CLOCK	EEPROM CLOCK
82	P87/TO2	I/O	MEM DATA	EEPROM DATA
83	V_{SS} (AV_{SS})	I	GND	GND
84	P90/AN00	I	DEST	Destination discrimination
85	P91/AN01	I	AFT	Ground wave tuner AFT detection
86	P92/AN02	I	C/N DET	Satellite antenna level detection
87	P93/AN03	I	A/D 3	Membrane key reading
88	P94/AN04	I	A/D 4	Membrane key reading
89	P95/AN05	I	A/D 5	Membrane key reading
90	P96/AN06	I	A/D 6	Membrane key reading
91	P97/AN07	I	A/D 7	Membrane key reading
92	V_{CC} (AV_{CC})	I	V_{CC}	V_{CC}
93	PA0/AN08	I	AUTO DIMMER	Peripheral luminance detection
94	PA1/AN09	I	CFL CURRENT	Cold-cathode tube lighting detection
95	PA2/AN10		VTR sw	
96	PA3/AN11	I	DIMMER SW	Cold-cathode tube luminance control sw det
97	PA4/LSI	I	LANC IN	LANC input
98	PA5/LSO	O	LANC OUT	LANC output
99	PA6/COUT	O	BUZZER	Buzzer output/clock liquid crystal frequency division output
100	V_{CC}	I	V_{CC}	V_{CC}

SECTION 8
ELECTRICAL ADJUSTMENTS

When adjusting, refer to the layout diagrams for adjustment related parts beginning from page 222.

This section contains information and instructions required for carrying out all the adjustments of the electrical circuit of this unit.

Equipments Used

1) Color TV
2) Single or dual trace type oscilloscope, band more than 30MHz, with delay mode
3) Frequency counter (more than 8 digits)
4) NTSC pattern generator
5) Digital voltmeter
6) Audio level meter
7) Audio generator
8) Attenuator
9) Distortion factor gauge
10) Audio multiple signal generator
11) Alignment tape
    Part code : H7099046H (MH-1)
12) Hi-Fi alignment tape
    Part code : H7099153H (Hi-Fi 400Hz)
13) Extension cable (19P) : J-6090-018-A
    (For RP-158 board)

Connection

Unless specified otherwise, connect the measurement equipments as shown below and carry out the adjustments.

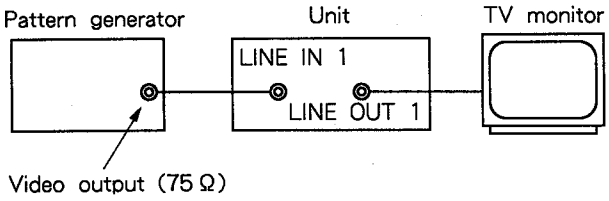


Fig. 8-1.

Setup for Adjustment

Because the video signal obtained from the pattern generator is used as the adjustment signal for electrical adjustments, it must satisfy the given specifications. Connect the oscilloscope to the video input terminal of the JK-104 board, and make sure that the amplitude of the sync signal of the video signal is approximately 0.3V, that of the video section is approximately 0.7V, that of the burst
signal is approximately 0.3V and flat, and the level ratio of the burst signal to the "red" signal is 0.30 : 0.33. Fig. 8-2 shows the video signal (color bar) used in electrical adjustments.

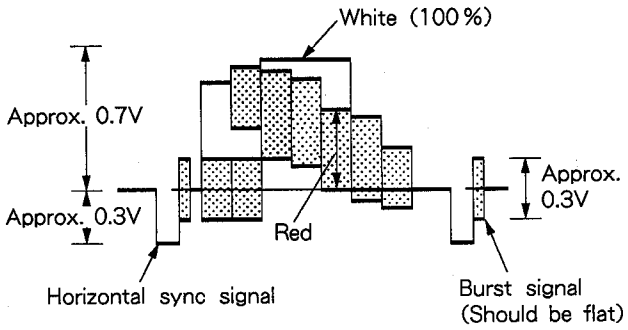


Fig. 8-2. Color Bar Signal of Pattern Generator

[Alignment Tape MH-1]

	Mode	Time	Video Signal	Audio Signal
1	SP	10min.	Stair-step	7kHz
2		5min.	———	3kHz
3		10min.	Color bar	1kHz
4		3min.	RF sweep	———

[Hi-Fi Alignment Tape]

	Mode	Time	Video Signal	Audio Signal
1	SP	10min.	Monoscope	Normal:No signal Hi-Fi:400Hz

Specified Input/Output Level and Impedance
Input/Output Terminal

Video input
Pin jack
Input signal : 1Vp-p, 75 Ω unbalanced, sync negative

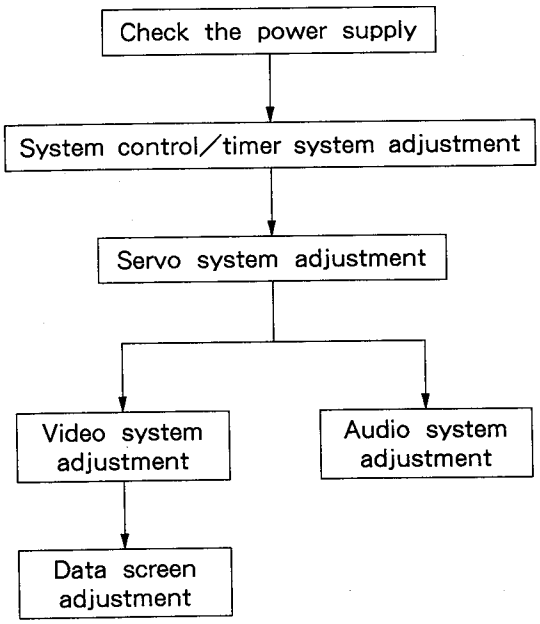
Video output
Pin jack
Output signal : 1Vp-p, 75 Ω unbalanced, sync negative

Audio line input
Pin jack
Input level : − 7.5dBs (0dBs = 0.775Vrms)
Input impedance : Above 45k Ω

Audio line output
Pin jack
Standard output : − 7.5dBs at 47k Ω load impedance
Output impedance : Below 10k Ω

Adjusting Sequence

Carry out the adjustments in the following sequence.



8-1. POWER SUPPLY BLOCK CHECK (SR-460 BOARD)

Mode	E-E
Measuring Instrument	Digital voltmeter
UNSW 6V check	
Measurement Point	Pin ⑤ of CN001
Specified value	5.9 ± 0.1Vdc
MTR 12V check	
Measurement Point	Pins ⑦ and ⑧ of CN001
Specified value	12.3 ± 0.3Vdc
DC 42V check	
Measurement Point	Pin ① of CN001
Specified value	42.0 ± 3.0Vdc
− 8V check	
Measurement Point	Pin ⑤ of CN002
Specified value	− 8.1 ± 0.3Vdc
+13V check	
Measurement Point	Pin ① of CN002
Specified value	13.1 ± 0.3Vdc

Checking Method:

1) Check that the voltages satisfy the specified values.

8-2. SYSTEM CONTROL/TIMER SYSTEM ADJUSTMENT

1. Clock Adjustment (ST-49 board)

Purpose:

To raise the accuracy of the clock.
If the clock is not accurate, its error difference will gradually increase.

Measurement Point	Pin ⑨⑨ of IC401
Measuring Instrument	Frequency counter (Interval counter mode)
Measuring Element	CT412
Specified Value	0.1249995 ± 0.0000005sec

Note: Do not adjust CT412 except when replacing IC401.

Adjusting Method:

1) Connect Pin ⑨⑥ of IC401 to the GND. (This sets the adjustment mode.)
2) Connect the frequency counter as shown in the figure below.
3) Adjust the oscillation frequency to the specified value using CT412.

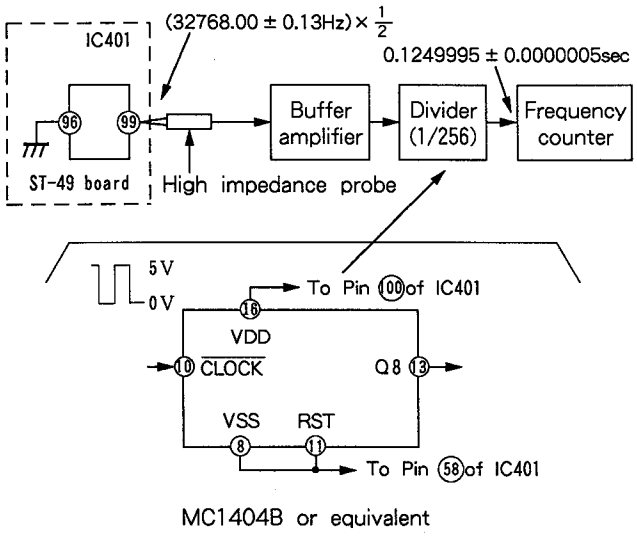


Fig. 8-3.

8-3. SERVO SYSTEM ADJUSTMENT

1. RF switching position adjustment (ST-49 board)

Purpose:

To adjust the link of the Ach and Bch of the tape playback outputs.
To make the unit compatible with other tapes and units.
If this specification is not satisfied, the link will appear on the screen and the screen will be disrupted, etc.

Mode	Playback
Signal	Alignment tape Hi-Fi 400Hz
Measurement Point	CH1:VIDEO LINE OUT terminal CH2:Pin ③ of CN803 (RF SWP) (RP-158 board)
Measuring Instrument	Oscilloscope
Adjusting Element	RV502
Specified Value	413 ± 32 μsec (6.5 ± 0.5H)

Adjusting Method:

1) Press the tracking buttons [▼] and [▲] (REMOTE COMMANDER) and adjust the tracking position to the center.
2) Adjust to 413 ± 32 μ sec (6.5 ± 0.5H) using RV502.

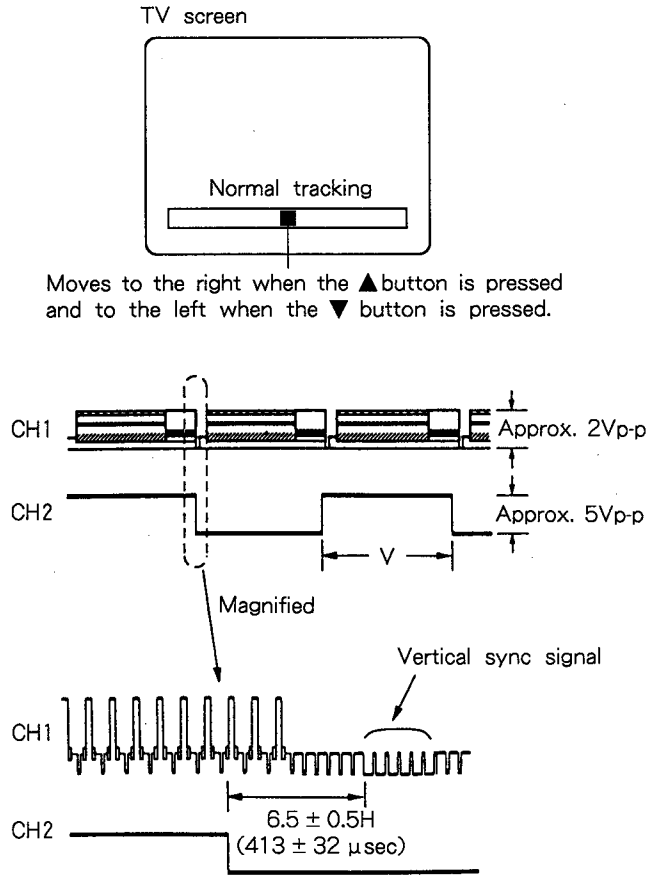


Fig. 8-4.

8-4. VIDEO SYSTEM ADJUSTMENT

Basically, adjust the video system in the following sequence.
The color video signal supplied from the pattern generator is used as the video input signal for adjusting the video system in the recording mode. Make sure that the sync signal and the color burst signal satisfy the specifications specified at the set-up for adjustments shown in Fig. 8-2.

Adjusting Sequence

1. Y level adjustment
2. C level adjustment
3. VHS E-E level adjustment
4. S-VHS E-E level adjustment
5. Y-Y_D adjustment
6. VHS carrier set and deviation adjustment
7. S-VHS carrier set and deviation adjustment
8. S-VHS white clip adjustment
9. 5MHz VCO adjustment
10. Comb filter (1H) adjustment
11. Comb filter (2H) adjustment
12. CNR adjustment
13. S-VHS recording chroma adjustment
14. VHS playback Y signal level adjustment
15. CPI carrier leakage adjustment

1. Y level adjustment (CF-31 board)

Purpose:
To adjust the luminance signal level after the Y/C separation circuit has been passed.
If this specification is not satisfied, the image will be too bright or dark.

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑨ of CN601
Measuring Instrument	Oscilloscope
Adjusting Element	RV601
Specified Value	0.5 ± 0.01Vp-p

Adjusting Method:
1) Adjust to 0.5 ± 0.01Vp-p using RV601.

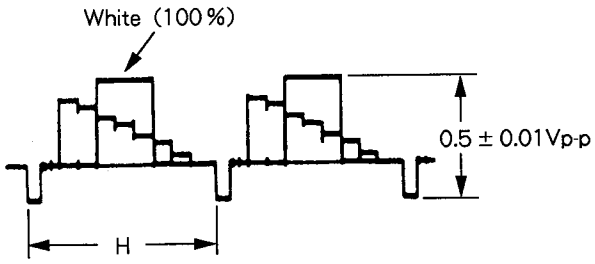
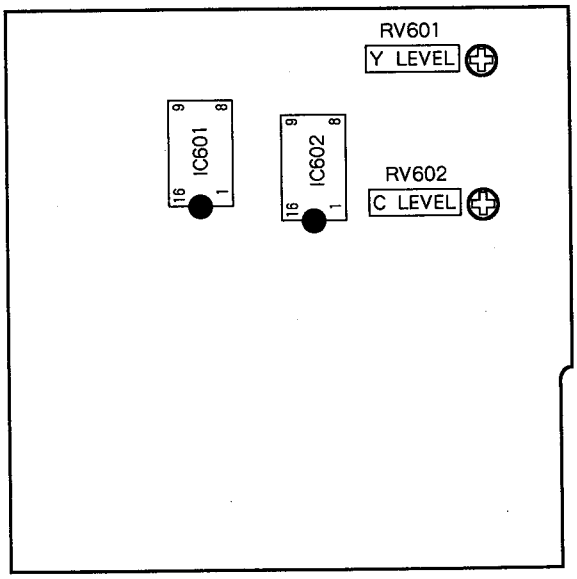


Fig. 8-5.

CF-31 BOARD (COMPONENT SIDE)



2. C level adjustment (CF-31 board)

Purpose:
To adjust the chroma signal level after the Y/C separation circuit has been passed.
If this specification is not satisfied, the image will be rough and the edges will be in a different color.

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑦ of CN601
Measuring Instrument	Oscilloscope
Adjusting Element	RV602
Specified Value	0.180 ± 0.01Vp-p

Adjusting Method:
1) Adjust to 0.180 ± 0.01Vp-p using RV602.

Fig. 8-6.

3. VHS E-E level adjustment (AV-23 board)

Purpose:
To adjust the luminance signal to the NTSC specified value.
If this specification is not satisfied, the image will be too bright or dark.

Mode	E-E (S-VHS mode)
Signal	Color bar
Measurement Point	Pin ⑭ of CN108
Measuring Instrument	Oscilloscope
Adjusting Element	RV108
Specified Value	2.0 ± 0.05Vp-p

Adjusting Method:
1) Adjust to 2.0 ± 0.05Vp-p using RV108.

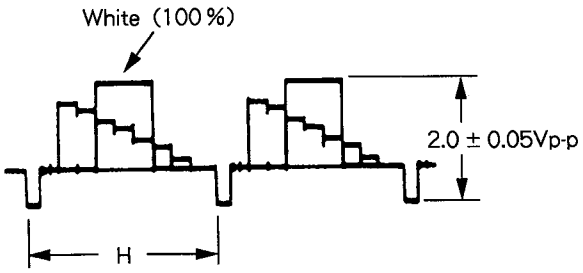


Fig. 8-7.

4. S-VHS level adjustment (AV-23 board)

Purpose:
To adjust the level at which the S-VHS signal is to be input into the luminance signal processing IC.
If this specification is not satisfied, the S-VHS played back image will be too bright or dark.

Mode	E-E (S-VHS mode)
Signal	Color bar
Measurement Point	Q202 emitter
Measuring Instrument	Oscilloscope
Adjusting Element	RV201
Specified Value	0.4 ± 0.01Vp-p

Adjusting Method:
1) Adjust to 0.4 ± 0.01Vp-p using RV201.

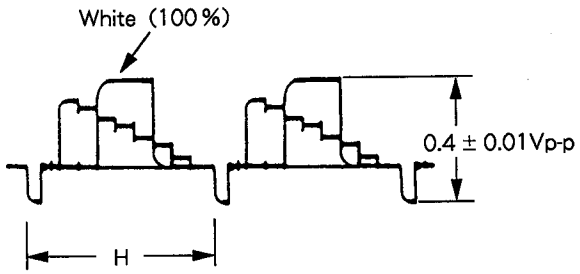


Fig. 8-8.

5. Y-Y_D adjustment (AV-23 board)

Purpose:
To adjust the characteristics of the Y comb filter.
If this specification is not satisfied, the S/N of the played back image will deteriorate.

Mode	E-E (S-VHS mode)
Signal	Color bar
Measurement Point	Pin ⑯ of IC101
Measuring Instrument	Oscilloscope
Adjusting Element	RV301
Specified Value	Minimum (Below 120mVp-p)

Adjusting Method:
1) Adjust to minimum using RV301.

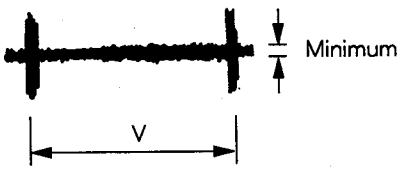


Fig. 8-9.

6. VHS carrier set and deviation adjustment (AV-23 board)

Purpose:
To adjust the VHS carrier frequency and FM modulation frequency bands to the same standard.
If this specification is not satisfied, the played back image will not be normal and the unit will not be compatible with other tapes and units.

Be sure to carry out this adjustment after the "14. VHS playback Y signal level adjustment" has been satisfied.

Carrier set	
Mode	E-E (VHS mode)
Signal	No signal
Measurement Point	Pin ② of CN106
Measuring Instrument	Frequency counter
Adjusting Element	RV104
Specified Value	3.40 ± 0.05MHz
Deviation	
Mode	E-E (VHS mode)
Signal	Color bar
Measurement Point	Pin ⑭ of CN108
Measuring Instrument	Oscilloscope
Adjusting Element	RV105
Specified Value	2.00 ± 0.05Vp-p

Adjusting Method:
1) Set the E-E mode in the "no signal" state.
2) Connect the frequency counter to Pin ② of CN106 and adjust to 3.40 ± 0.05MHz using RV104.
3) Input the color bar signal and record.
4) Playback the recorded signal and check the playback Y signal level of Pin ⑭ of CN108.
   Specification : 2.00 ± 0.05Vp-p.
   The above should be satisfied.
5) If it is not, adjust using RV105 until it is satisfied.
6) Repeat steps 4) and 5) until the specification is satisfied.

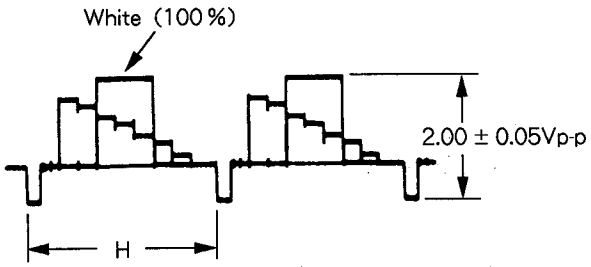


Fig. 8-10.

7. S-VHS carrier set and deviation adjustment (AV-23 board)

Purpose:
Adjust the S-VHS carrier frequency and FM modulation frequency bands to the same standard.
If this specification is not satisfied, the played back image will not be normal and the unit will not be compatible with other tapes and units.

Be sure to carry out this adjustment after the "3. VHS E-E level adjustment, 4. S-VHS E-E level adjustment, 15. S-VHS playback Y level adjustment" have been satisfied.

Carrier set	
Mode	E-E (S-VHS mode)
Signal	No signal
Measurement Point	Pin ② of CN106
Measuring Instrument	Frequency counter
Adjusting Element	RV103
Specified Value	5.40 ± 0.05MHz
Deviation	
Mode	E-E (S-VHS mode)
Signal	Color bar
Measurement Point	Pin ⑭ of CN108
Measuring Instrument	Oscilloscope
Adjusting Element	RV106
Specified Value	2.00 ± 0.05Vp-p

Adjusting Method:
1) Set the E-E mode in the "no signal" state.
2) Connect the frequency counter to Pin ② of CN106 and adjust to 5.40 ± 0.05 MHz using RV103.
3) Input the color bar signal and record.
4) Playback the recorded signal and check the playback Y signal level of Pin ⑭ of CN108.
   Specification : 2.0 ± 0.05 Vp-p.
   The above should be satisfied.
5) If it is not, adjust using RV106 until it is satisfied.
6) Repeat steps 4) and 5) until the specification is satisfied.

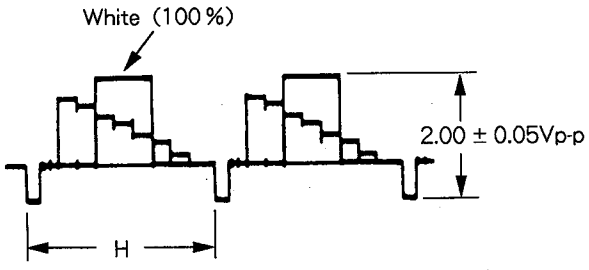


Fig. 8-11.

8. S-VHS white clip adjustment (AV-23 board)

Purpose:

To erase the over-short produced by the pre-emphasis circuit.

If this adjustment is not carried out, over-modulation will occur and noise will appear on the played back image.

Mode	E-E (S-VHS mode)
Signal	Color bar
Measurement Point	Pin ㉚ of IC101
Measuring Instrument	Oscilloscope
Adjusting Element	RV107
Specified Value	210 ± 5%

Adjusting Method:

1) Adjust the peak of white 100% to 210 ± 5% using RV107.

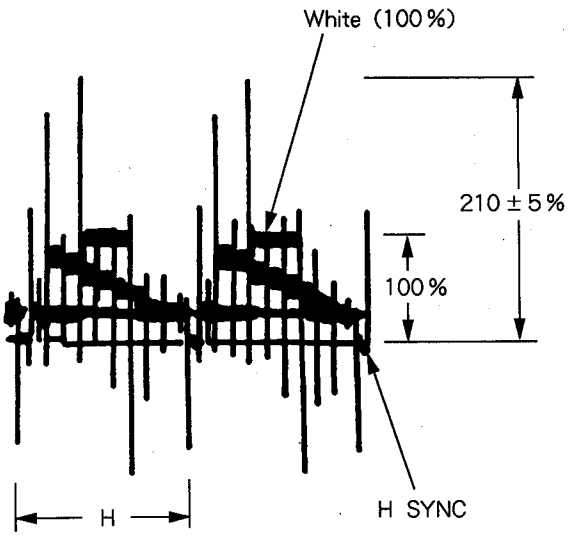


Fig. 8-12.

9. 5MHz VCO adjustment (AV-23 board)

Purpose:

To compare the phase with that of the horizontal sync signal, control the $320f_H$ generator with the error voltage, and lock the color signal.

If this specification is not satisfied, the color of the image will not be even or the color will be different.

Mode	E-E
Signal	No signal
Measurement Point	Pin ③ of IC401
Measuring Instrument	Frequency counter
Adjusting Element	RV401
Specified Value	15.734 ± 0.3kHz

Preparation

1) Connect Pins ② and ㊺ of IC401 to GND.

Adjusting Method:

1) Adjust to 15.734 ± 0.3kHz using RV410.

10. Comb filter (1H) adjustment (AV-23 board)

Purpose:

To erase the cross-talk signal contained in the chroma signal during playback.

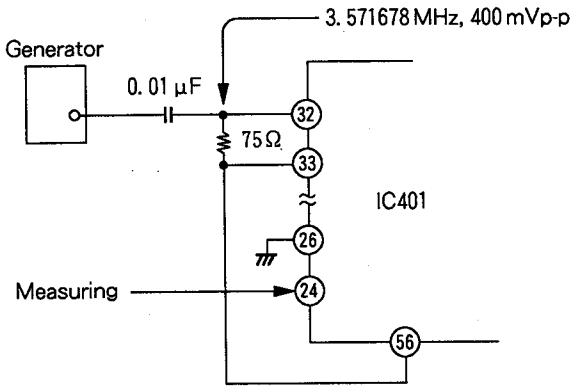
If this specification is not satisfied, noise will appear on the played back image.

Mode	Playback
Signal	Alignment tape MH-1 (color bar)
Measurement Point	Pin ㉔ of IC401
Measuring Instrument	Oscilloscope
Specified Value	Below 20mVp-p
1H PHASE	
Adjusting Element	RV403
1H GAIN	
Adjusting Element	RV406

Preparation

1) Connect a 75Ω resistor between Pins ㉜ and ㉝ of IC401.
2) Connect Pins ㊻ and ㉝ of IC401.
3) Input the 3.571678MHz 400mVp-p signal from the generator to Pin ㉜ of IC401 via the 0.01μF.
4) Connect Pin ㉖ of IC401 to the GND.

Connection



Adjusting Method:

1) Adjust to below 20mVp-p using RV403 and RV406.
2) If the specified value is not satisfied, adjust again.

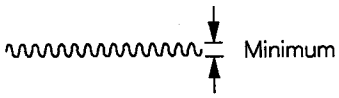


Fig. 8-13.

11. Comb filter (2H) adjustment (AV-23 board)

Purpose:

To erase the cross-talk signal contained in the chroma signal during playback.

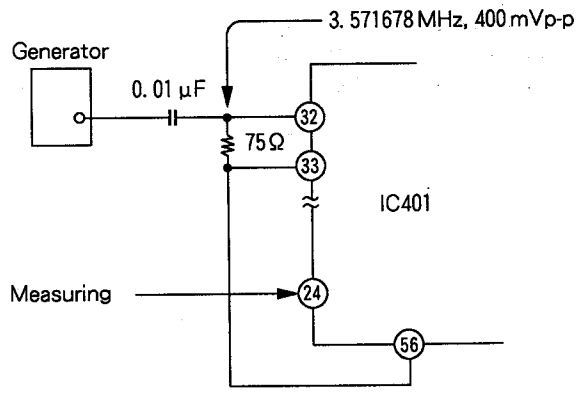
If this specification is not satisfied, noise will appear on the played back image.

Mode	Playback
Signal	Alignment tape MH-1 (color bar)
Measurement Point	Pin ㉔ of IC401
Measuring Instrument	Oscilloscope
Specified Value	Below 20mVp-p
2H PHASE	
Adjusting Element	RV405
2H GAIN	
Adjusting Element	RV407

Preparation

1) Connect a 75Ω resistor between Pins ㉜ and ㉝ of IC401.
2) Connect Pins ㊻ and ㉝ of IC401.
3) Input the 3.571678MHz 400mVp-p signal from the generator to Pin ㉜ of IC401 via the 0.01μF.

Connection



Adjusting Method:

1) Adjust to below 20mVp-p using RV405 and RV407.
2) If the specified value is not satisfied, adjust again.

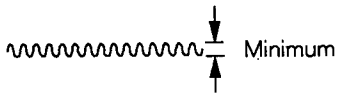


Fig. 8-14.

12. CNR adjustment (AV-23 board)

Purpose:

To erase the noise components in the playback chroma signal.

If this specification is not satisfied, the color of the played back image will not be normal.

Mode	Playback
Signal	Alignment tape MH-1 (color bar)
Measurement Point	Pin ⑫ of IC401
Measuring Instrument	Oscilloscope
Specified Value	Minimum noise level (within 150mVp-p)
CNR PHASE	
Adjusting Element	RV404
CNR GAIN	
Adjusting Element	RV408

Adjusting Method:

1) Adjust RV404 and RV408 alternately until the noise level becomes minimum (within 1150mVp-p).

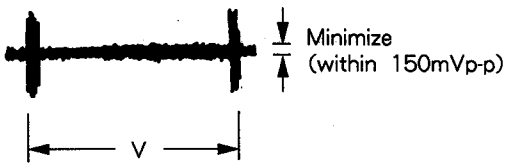


Fig. 8-15.

13. S-VHS recording chroma signal level adjustment (AV-23 board)

Purpose:

To adjust the level of the color signal during recording to the specified value.

If greater than this level, diagonal lines will be produced on the played back image. If smaller, the image will not be in color.

Mode	E-E (S-VHS mode)
Signal	Color bar
Measurement Point	Q402 emitter
Measuring Instrument	Oscilloscope
Adjusting Element	RV402
Specified Value	370 ± 5mVp-p

Adjusting Method:

1) Adjust the level of the color bar (red) to 370 ± 5mVp-p using RV402.

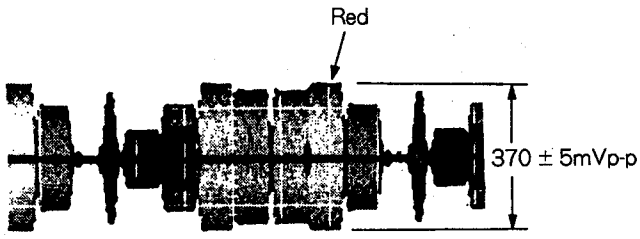


Fig. 8-16.

14. VHS playback Y signal level adjustment (AV-23 board)

Purpose:

To adjust the level of the luminance signal during playback to the NTSC standard.

If this specification is not satisfied, the image will be too bright or dark during playback.

Mode	Playback (VHS mode)
Signal	Alignment tape MH-1 (color bar)
Measurement Point	Pin ⑭ of CN108 (Check that the monitor display is normal)
Measuring Instrument	Oscilloscope
Adjusting Element	RV102
Specified Value	2.0 ± 0.05Vp-p

Adjusting Method:

1) Adjust to 2.0 ± 0.05Vp-p using RV102.

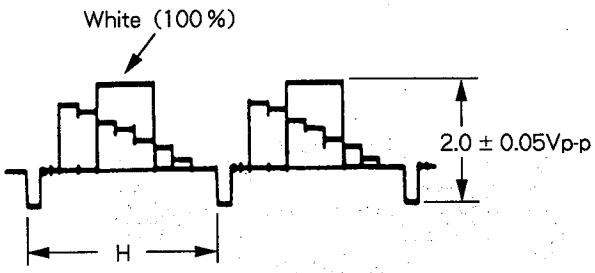


Fig. 8-17

15. S-VHS playback Y signal level adjustment (AV-23 board)

Purpose:

To adjust the level of the luminance signal during playback to the NTSC standard.

If this specification is not satisfied, the image will be too bright or dark during playback.

Mode	Playback (S-VHS mode)
Signal	Alignment tape (S-VHS) color bar
Measurement Point	Pin ⑭ of CN108 (Check that the monitor display is normal)
Measuring Instrument	Oscilloscope
Adjusting Element	RV101
Specified Value	2.0 ± 0.05Vp-p

Adjusting Method:

1) Adjust to 2.0 ± 0.05Vp-p using RV101.

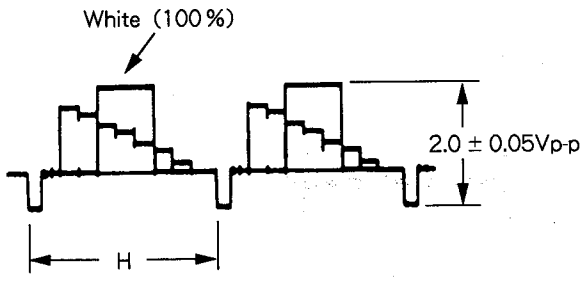


Fig. 8-18.

16. CPI carrier leakage adjustment (VI-119 board)

Purpose:

To modulate at 3.58MHz and minimize the carrier leakage produced when the color signal is to be obtained. If this specification is not satisfied, the color of the image will not be normal.

Mode	Playback
Signal	Alignment tape MH-1 (color bar)
Measurement Point	Pins ㉔ of CN602 or Pin ⑯ of CN602
Measuring Instrument	Oscilloscope
Specified Value	Minimum (Below 15mVp-p)
Carrier balance 1	
Adjusting Element	RV501
Carrier balance 2	
Adjusting Element	RV502

Note: Connect a 3.58MHz band pass filter to the probe. (This filter will not be required for Pin ⑯ of CN602.)

Adjusting Method:

1) Adjust to minimum (Below 15mVp-p) using RV501 and RV502.
2) If this standard is not satisfied, adjust again.

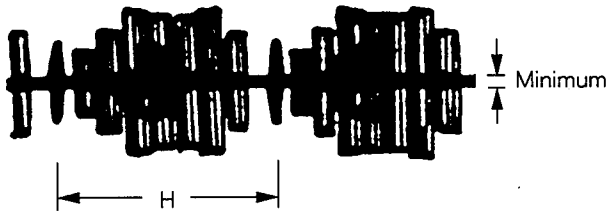


Fig. 8-19.

8-5. DATA SCREEN ADJUSTMENT

1. 4fsc clock check (VI-119 board)

Mode	E-E
Signal	No signal
Measurement Point	(Note) Pin ⑧ of IC301
Measuring Instrument	Frequency counter
Specified Value	14318180 ± 500Hz

Note: Using a low capacity (below 10pF) and high input resistance (above 1MΩ) probe, connect the frequency counter to the measuring point via a 1kΩ resistor (1-249-417-11).

Checking Method:

1) Check that the clock frequency satisfies the specified value.
   (Due to the effects of the probe, a value lower than the actual frequency by 100Hz may be displayed.)

2. Character clock frequency check (VI-119 board)

Mode	Playback
Signal	Alignment tape Color bar or stair step
Measurement Point	(Note) Pin ⑮ of IC301
Measuring Instrument	Frequency counter
Specified Value	7.0 ± 0.3MHz

Note: Using a low capacity (below 10pF) and high input resistance (above 1MΩ) probe, connect the frequency counter to the measuring point via a 1kΩ resistor (1-249-417-11).

Checking Method:

1) Check that the clock frequency satisfies the specified value.
   (Due to the effects of the probe, a value lower than the actual frequency by 0.1 to 0.2MHz may be displayed.)
2) Make sure that the tracking display is shown at the center of the monitor screen horizontally when manual tracking is turned on.

8-6. AUDIO SYSTEM ADJUSTMENT

Connection

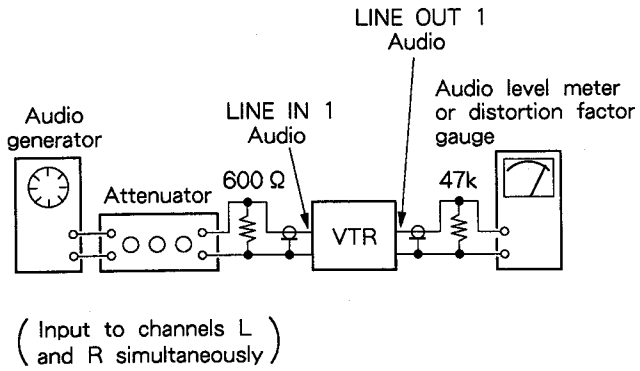


Fig. 8-20.

8-6-1. Hi-Fi audio system adjustment

Unless specified otherwise, set the following and adjust.
Input selection ····· Line 1
Audio monitor ····· Stereo
Bass boost switch ····· Off

Adjusting Sequence

1. VCO f_0 adjustment
2. Deviation adjustment
3. Band pass filter f_0 adjustment
4. AF switching position adjustment

1. VCO f_0 adjustment (HF-27 board)

Purpose:

To attain HiFi audio compatibility.
If this specification is not satisfied, the sound will be distorted.

Mode	Recording
Signal	No signal
1.3MHz adjustment	
Measurement Point	Pin ㉞ of IC201
Measuring Instrument	Frequency counter
Adjusting Element	RV206
Specified Value	1.3MHz ± 1kHz
1.7MHz adjustment	
Measurement Point	Pin ㊼ of IC201
Measuring Instrument	Frequency counter
Adjusting Element	RV202
Specified Value	1.7MHz ± 1kHz

Note: Connect the frequency counter via a high input resistance (above 1MΩ) and low capacity (below 10pF) buffer amplifier (oscilloscope, etc.).

Adjusting Method:

1) Connect the frequency counter to Pin ㉞ [Pin ㊼] of IC201.
2) Adjust to 1.3MHz ± 1kHz [1.7MHz ± 1kHz] using RV206 [RV202].

2. Deviation adjustment (HF-27 board)

Purpose:

To adjust the HiFi audio level to the specified value. To make the unit compatible with other tapes and units. If this specification is not satisfied, the maximum and minimum sound levels will vary widely during playback.

Mode	Playback
Signal	Alignment tape HiFi 400Hz
Measurement Point	AUDIO LINE OUT
Measurement Equipment	Audio level meter
Adjusting Element	RV207 [RV203]
Specified Value	− 7.5 ± 0.2dBs

Note : The adjusting element for the R channel is shown in the [ ].
Adjust the REC level volume to the center click position.

Adjusting Method:

1) Make sure that "STEREO" segment lights on the fluorescent display tube.
1) Adjust left [right] channel audio output level to − 7.5 ± 0.2dBs using RV207 [RV203].

3. Band pass filter f_0 adjustment (HF-27 board)

Purpose:

To separate the carrier accurately and ensure that the filter for cutting the video signal functions normally. If this specification is not satisfied, the sound will be distorted.

Mode	Playback
Signal	1.505MHz
Connection Point	Pin ⑯ of CN202
Measurement Point	Pin ⑱ of CN202 [Pin ㊽ of IC201]
Measuring Instrument	Oscilloscope
Adjusting Element	RV204
Specified Value	Adjust the A and B amplitudes to the same level.

Connection

1) Disconnect CN202 of the HF-27 board and input the 1.505MHz and 200mVp-p sine wave from the signal generator to Pin ⑯ of CN202.

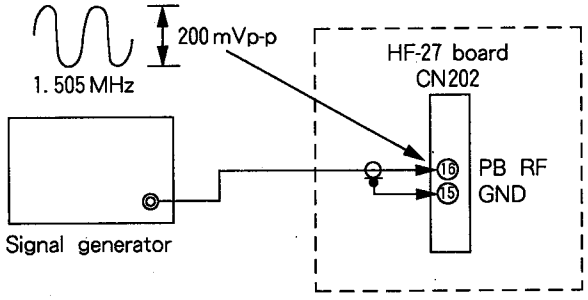


Fig. 8-21.

Adjusting Method:

1) Rotate RV204 fully in the counterclockwise direction (↺) as seen from the component side.
2) Rotate RV204 slowly in the clockwise direction(↻) until the amplitudes of Pin ⑱ of CN202 and Pin ㊽ of IC201 become equal.

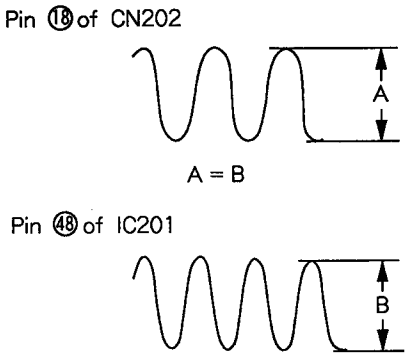


Fig. 8-22.

4. AF switching position adjustment (ST-49 board)

Purpose:

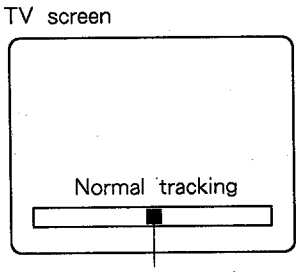
To adjust the link of the Ach and Bch of the tape playback outputs.

If this specification is not satisfied, the noise will increase and cracking sounds will be produced.

Mode	Playback
Signal	Alignment tape Hi-Fi 400Hz
Measurement Point	CH1:Pin ③ of CN803 (RF SWP) (RP-158 board) CH2:Pin ④ of CN102 (RF MONI) (AV-23 board)
Measuring Instrument	Oscilloscope
Adjusting Element	RV501
Specified Value	No dropouts in the RF signal

Adjusting Method:

1) Press tracking buttons ▼ and ▲ (remote commander) and adjust the tracking position to the center.
2) Adjust to the minimum specified value using RV501.



Moves to the right when the ▲button is pressed and to the left when the ▼ button is pressed.

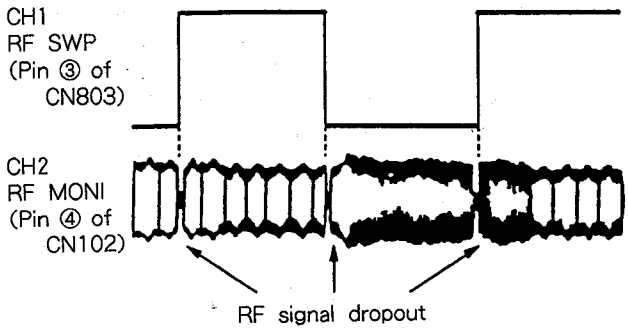


Fig. 8-23.

8-6-2. Normal audio system adjustment

- Adjust in the SP mode.
- Adjust the audio monitor to normal (＊1).

＊1 : State in which the fluorescent display tube does not display "Stereo", "Main Left", or "Sub Right" during playback.

Adjusting Sequence

1. ACE head adjustment
2. Recording bias adjustment

1. ACE head adjustment

Refer to VHS MECHANICAL ADJUSTMENT MANUAL II (9-972-816-11).

2. Recording bias adjustment (AV-23 board)

Purpose:

To set the frequency characteristics of the high band portion of normal audio.

If this specification is not satisfied, excessive high sounds will be produced or no high sound will not be produced.

Mode	Recording
Signal	No signal
Measurement Point	Pin ① of CN102
Measuring Instrument	Digital voltmeter (AC)
Adjusting Element	RV851
Specified Value	3.0 ± 0.1mV

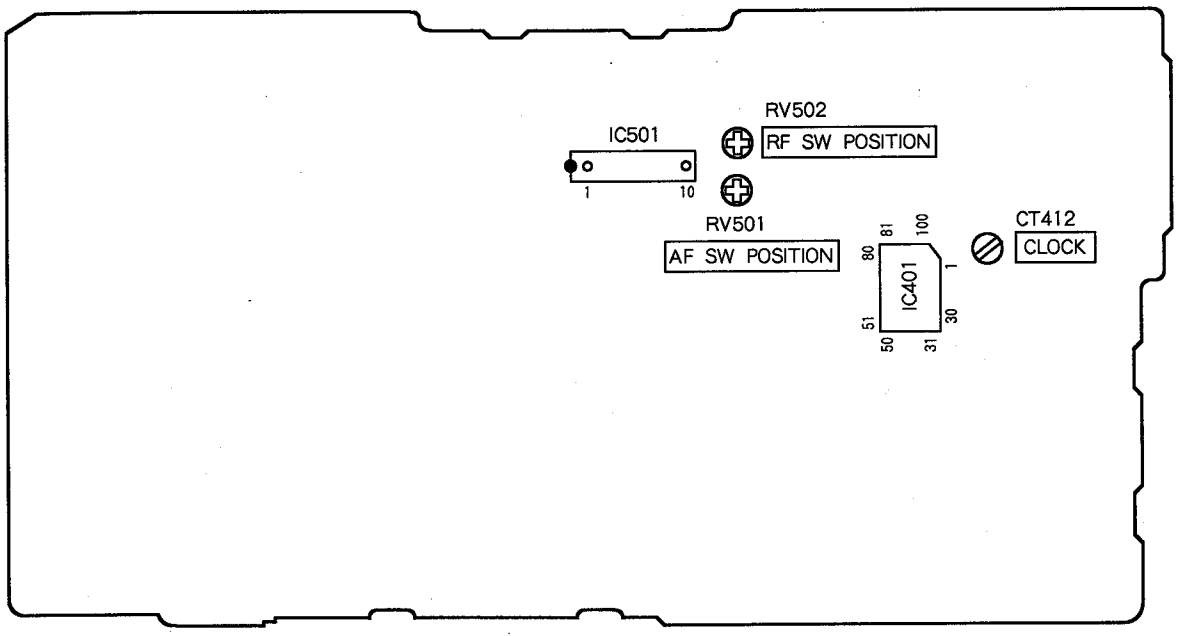
Note : Use a digital voltmeter that can operate to AC 100kHz.

Adjusting Method:

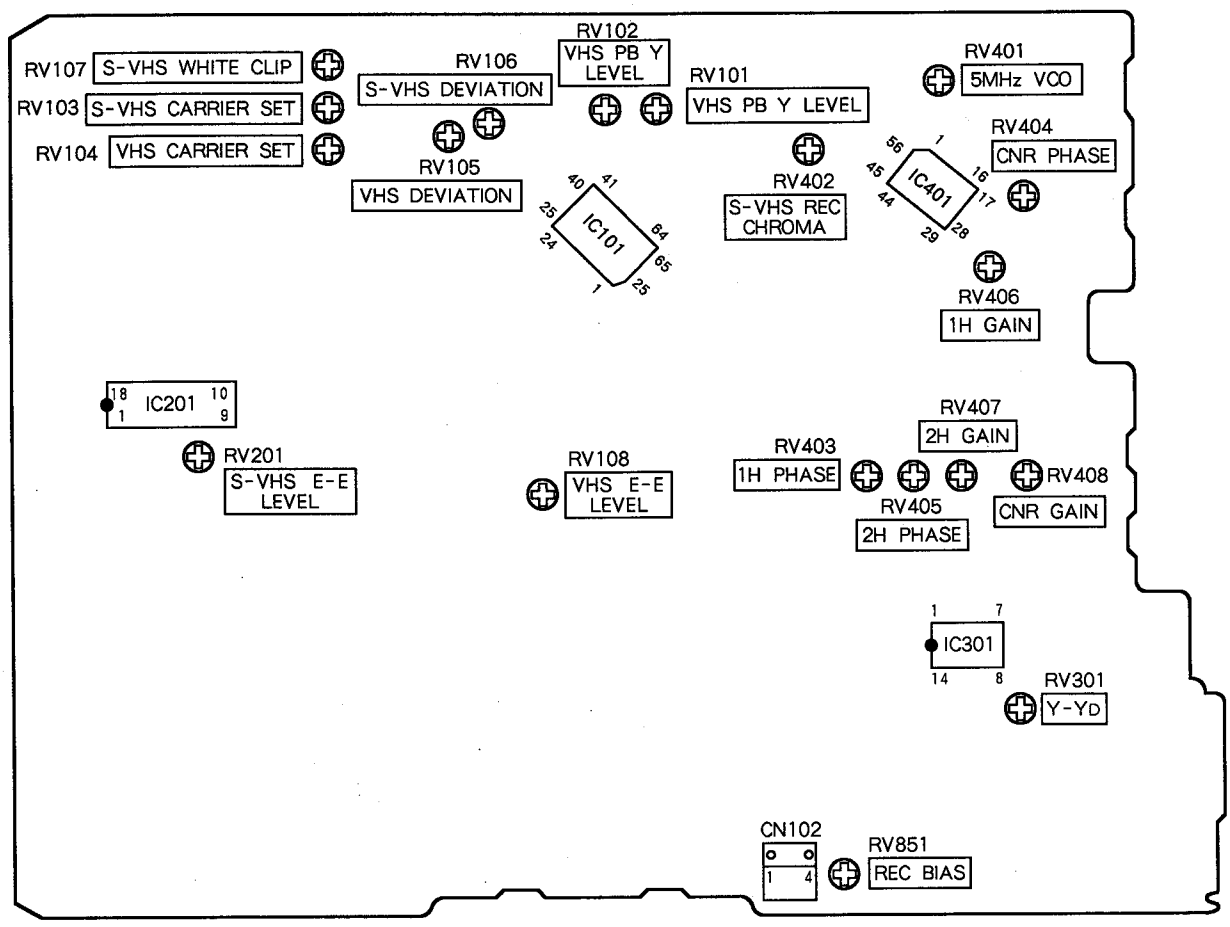
1) Adjust so that the level between Pins ① and ② of CN102 becomes 3.0 ± 0.1mV using RV851.

8-7. PARTS ARRANGEMENT DIAGRAM FOR ADJUSTMENTS

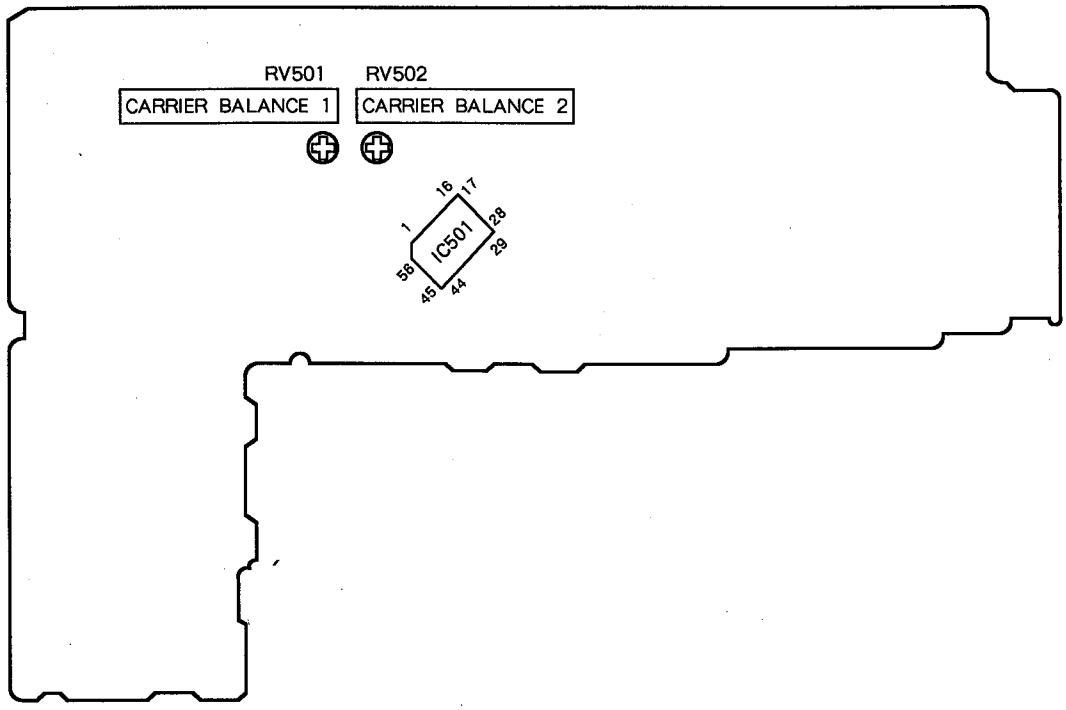
ST-49 BOARD (COMPONENT SIDE)



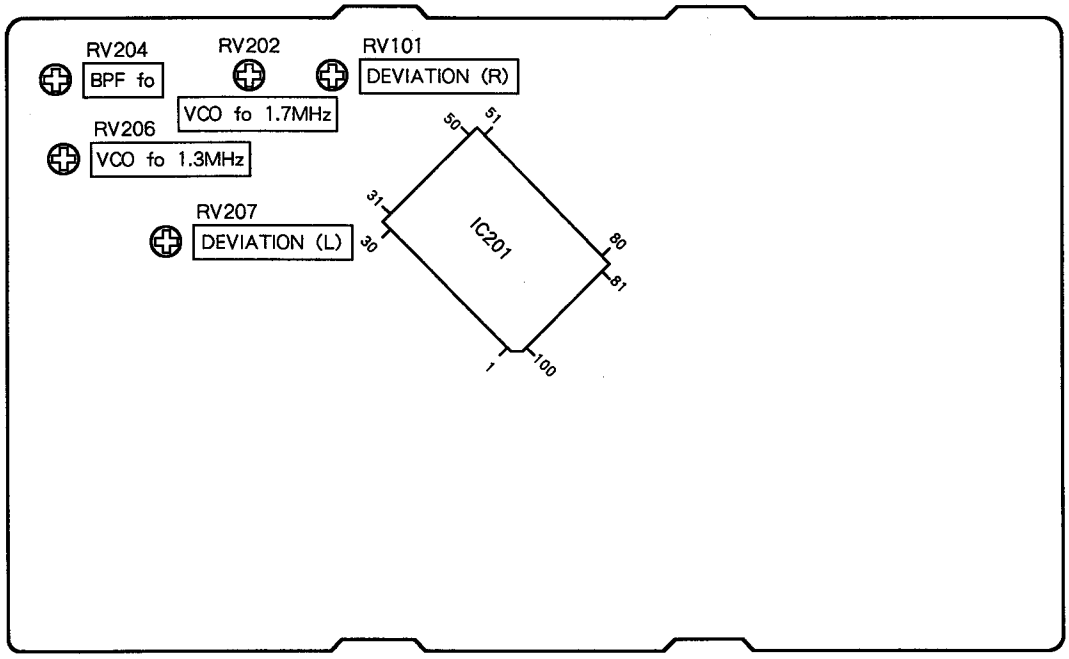
AV-23 BOARD (COMPONENT SIDE)



VI-119 BOARD (COMPONENT SIDE)



HF-27 BOARD (COMPONENT SIDE)



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